GamesAudit
Audit and Project Management Services

A Digital Gaming Strategy for Malta

A Report to guide a National Policy in the setting up of a Digital Games Industry in Malta in accordance with a range of references.

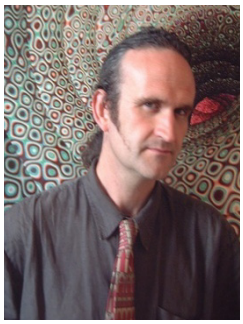
Digital Gaming Strategy for Malta Report Version 2.0.[1]

Date: 1st February 2012

[1] "A Digital Gaming Strategy for Malta" is an independent Report prepared by Games Audit UK Ltd. The Report does not necessarily reflect the views of Malta Enterprise, the University of Malta and the Malta Council for Science and Technology, on whose behalf it was prepared. Extracts from the document have been removed due to confidentiality and data protection issues.

Our Team

Professor WILLIAM LATHAM

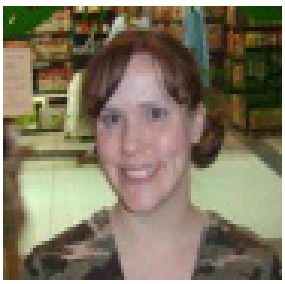


CEO of Games Audit Ltd, the leading operational and technical due Diligence Company for investors, banks and completion bond companies. While CEO of leading games developer Computer Artworks William produced the hit Playstation and Xbox game The Thing based on the cult movie for Universal Studios. He is Professor at Goldsmiths (University of London).

IAN SHAW

Director of Games Technology Consulting. Across a 20 year career Ian has shipped games selling more than 50 million units, including Harry Potter, Formula-1 and Kinect. Ian was previously Chief Technology Officer of Electronic Arts Europe, Publishing Development Manager at Microsoft, and Head of R&D at Bullfrog Productions.

HEATHER CHANDLER



After producing numerous hits for Electronic Arts, Ubisoft, and Activision, Heather founded Media Sunshine in 2005, a full-service game production provider. During her time in the industry Heather has worked on numerous titles, including Sacred 2: Fallen Angel, Two Worlds, Monster Madness: Grave Danger, Rainbow Six 3: Raven Shield, and eight games in the Ghost Recon series. She is the author of several books on game development and a frequent guest speaker at conferences and universities. She graduated with honours from Vanderbilt University and received an M.A. from the USC School of Cinematic Arts.

Dr. GORDON CALLEJA

Associate Professor and the Head of the Center for Computer Games Research at the IT University of Copenhagen. Gordon currently teaches on the Media Technology and Games MSc Programme at the Center for Games Research. Gordon has published extensively within the field of Games Research primarily in the areas of game involvement, immersion and presence, narrative and game ontology. He has recently published a book on game involvement and immersion with MIT Press titled "In-Game:From Immersion to Incorporation".

CHRIS LEEBETTER

Currently Director of Directed Research, Chris was previously Director of Programmes for Digital Markets and Enabling Technologies at ITI Techmedia, and Scottish Enterprise. Among numerous advisory assignments, Chris advised Enterprise Ireland on how to improve the innovation capability of companies in the digital media and games space. As a member of the Technology Advisory Group, Chris developed a technology strategy for Scotland published as "Towards a Brighter Future". Chris previously worked for over 18 years at technology consultancy Sagentia in Cambridge.

Professor FREDERIC FOL LEYMARIE

Professor of Computing at Goldsmiths (University of London), Co-Director of the post-graduate program in Computer Games and Entertainment at Goldsmiths College. Current research projects include ProGen (procedural modelling of 3D cities in games) in collaboration with leading UK Games Developer Rebellion

NICK GIBSON

Founder and Director of Games Investor Consulting is a specialist games research, corporate finance and strategic management consultancy

RICK GIBSON

Founder and Director of Games Investor Consulting is a specialist games research, corporate finance and strategic management consultancy,

Nick and Rick have advised over 80 international clients (including 6 government departments in 2 countries) with specialist analysis of the games industry, authoring or editing a broad range of research reports published by Screen Digest, the UK government, two trade bodies and NESTA.

JEANINE RIZZO

Associate, Fenech & Fenech Advocates in Valletta. Jeanine practices in intellectual property law, copyright, trademarks, patents, design rights, art and cultural heritage law, and entertainment law. She is also a lecturer on Intellectual Property Procedure, Diploma in the Laws of Procedure, with the University of Malta.

Executive Summary

Goals. In May 2011, Malta Enterprise, on behalf of the Digital Games Initiative Group comprising ME, MCST, UoM and the Creative Economy Working Group, contracted the UK company Games Audit Ltd to undertake research, interviews and analysis to deliver a report required to guide a national policy in the setting up of a Digital Games Industry in Malta in accordance with a range of references.

The aim of the report was to work at two levels, firstly to attract foreign direct investment (FDI) and secondly to identify ways of stimulating, supporting and expanding the local games industry in Malta.

Exciting Opportunities. The worldwide games industry (valued at $49bn in 2010 more than doubling in size since 2005 due to substantial growth in both retail and network gaming) is expanding rapidly and is expected to experience a CAGR between 2010 and 2014 of 9% but is fragmenting at the same time with many emerging new platforms and technologies - varying from console to tablet, mobile to online and social and associated new business models. "Gamification" is even extending game play elements into other software applications and apps. The expanding games market and its central role in the Creative Industries presents many opportunities for Malta but also challenges.

Methodology. The methodology used to produce this report included Games Audit using its own expert in house staff combined with a number of industry experts from the UK and USA. Standard research methods such as comparative analysis, gap analysis, and modelling were used to build on conclusions from important face to face interviews. Director William Latham and Gordon Calleja spent considerable time in Malta in July and August 2011 carrying out local audits and interviews. The help of Maltese companies interviewed was much appreciated and local audit work was supported by Jeanine Rizzo from Fenech and Fenech Advocates.

The International consultations included interviews with leading games industry figures at the E3 Games Conference in Los Angeles (the largest global annual games conference) in May and the Develop Games Conference (the leading European Games Conference on casual and mobile games) in Brighton, UK in July. Other interviews, such as with major game publishers, were secured through the teams extensive personal contact network. Work by Rick and Nick Gibson, in addition to looking at games industry trends, included analysis of existing fiscal incentives such as tax incentives offered by other territories to attract games companies. A range of countries were analysed and evaluated including Canada (Quebec), Singapore and France with the purpose of identifying specific fiscal incentives offered that Malta could choose to adopt or adapt.

Overall Findings. The overall findings of the report showed that Malta has a very early stage games industry, with small and energetic companies who are highly motivated to do well, often aided by Government incentives and occasionally EU Grants. A small number of related companies in advertising, localisation, editing, audio, legal, and finance give indications of an early stage industry framework for outsourcing and collaborative work that could expand. The strong IT industry with over 200 operations in Malta provides a sound technical context for games development work, experienced technical staff available with specialist skills relevant to the growth areas of the games industry including analytics and data mining expertise. Where additional support is needed to cover any small games specific skills gaps, short training courses are provided by educational establishments. The recently started and commendable annual "indie games" competitions are also assisting in developing skills, enthusiasm and team work around games at a local level in Malta.

The industry consultations revealed that international games companies view the low games industry headcount in Malta as a major concern, it also revealed that the existing "refund on dividends scheme" offered by Malta which offers tax refunds on the dividends that are paid to company shareholders was viewed as a strong benefit by small / medium privately owned games companies subject to knowing what other incentives are on offer.
Malta Enterprise's strong history of, and ability to, rapidly engage with companies interested in locating to Malta and where appropriate construction of large scale bilateral investment deals to the benefit of Malta and the relocating company will be an important element of growing the Digital Games industry moving forward.

The industry consultations revealed that currently games companies knew little of what Malta offers in terms of incentives and opportunities and that significant marketing is necessary in the games industry press and at games industry conferences. The report goes into depth on other feedback from the international consultations.

Transferable Skills from Film. Malta is an exciting location for the film industry, with potential for shared resources with games such as motion capture. There is currently a minimal post production industry in Malta, which shares many similarities with games development, however this does not provide a significant enough foundation for a games industry to grow out of the film industry in Malta. There is strong potential for sharing resources across games and films in Malta, in particular around shared technical facilities such as motion capture and sound studios and there are indications that plans developing to enable that synergy. It is noted that the film work does help Malta's creative image, and should be capitalised on in any advertising / press around games in Malta.

Transferable Skills from Gambling. The local audit spent time trying to identify skills and technologies in Malta that could be translated from gambling to games to give a competitive advantage. Interviews with leading recruitment agencies and IT companies identified a strong potential for the transfer of skilled individuals with high value statistical analysis and player analytics skills from the i-Gaming industry which could be directly applied to online casual games. There is a shortage of experts with these analytical skills worldwide, so this existing skill set should be capitalised upon and enhanced with additional courses hosted by Malta academic institutions. The legal / monitoring / regulatory skills may be transferable including into niche areas such as skills gaming

Business Culture. One significant concern, which extends beyond games, was the lack of Angel / early stage investment to encourage start-up companies, and the reliance only on bank finance with associated guarantees or similar. The other was the lack of business networking / hot desk meeting places where games people and other people from creative industries (including film and advertising) and investors can work and meet, of the type seen at TechHub in London (where the Midpoint Review Meeting was held). The Kordin Business Incubation Centre (KBIC) business centre though suitable for engineering based companies does not provide a environment suitable for the computer games industry's early stage companies and does not include hot desk arrangements. It is important that these two issues are addressed and in the report we cover this but do not present a full solution given their scope beyond games.

It was clear that Malta needs to take a number of key steps to establish a strong games industry.

These are:-

Attract global games companies: By offering a new range of fiscal and other support measures to drive FDI into Malta. The suite of incentives currently on offer by Malta Enterprise (as detailed in Section 4.5.4 Fiscal Incentives and Development Schemes) is suitable for a wide range of companies, particularly those with private shareholders. However the existing incentives are largely not tailored to the specific needs of games companies and they will need enhancing to make it as attractive and competitive a package as existing incentives offered by some Canadian provinces and other territories such as Singapore.

Today, Maltese companies have one of the most tax-advantageous corporate structures within the European Union because Malta operates a full imputation system on tax. This allows for no further tax to be due by non-resident shareholders on receipt of dividends distributed out of profits of a company. These distributions may also trigger refunds of Malta tax paid by the company. The standard refund is 6/7ths of a 35 per cent corporate tax rate. The effective tax rate will generally range from 0% to -5%. The recently approved 15% tax capping extension to digital gaming directors and games designers' salaries assists with this.

It is worth noting that the Malta incentives are of a different character, and will be less familiar to established games publishers and companies who have been preoccupied with the Canadian incentive offerings over many years which are primarily focussed on Production tax credits.

It is recommended to start planning early the following scheme ("Conversion Scheme"): In view of the fact that the process of digital games production often takes considerable time from idea development to take to market, the issue of cash flow is often crucial. Financial incentives to contribute towards such costs can determine location decisions. it is therefore recommended that government in some cases considers the conversion all or some of the tax credits accrued from investment aid or R&D aid into cash . The quantum of cash conversion may depend on generation of new job opportunities, enhancement of skills, training and HR development and the credibility and importance of the operation. Setting a specific budget/fund beforehand may be an further attraction to Companies to invest in Malta.

Moving forward it is key that the Malta incentives are explained carefully to selected interested parties and it is recommend that a specialist brochure with flow diagrams showing how the mechanics work with sample user case scenarios be developed.

Attending trade shows such as GDC Game Developer Conference in San Francisco and E3 in Los Angeles will provide ideal opportunities to find and meet interested companies.

Moving forward it is important to track incentives being offered by other territories and be alert to new opportunities around emerging online technology and production focussed funding / investment, including completion bonding for computer games.

Encourage local games start-ups: Trigger a new generation of games start-ups in Malta by appropriate grants, aiding Angel Investment and specialist training courses. The report in Chapters 1,4,5 and 7 in addition to the Recommendations in Section 8.1 gives extensive detail on how to achieve this and how that activity should to be orchestrated

Enhance education: Enhance Maltese education provision by adding new targeted courses, to deliver raw recruits for overseas and start-up games companies across technology, art and production. Additionally, establishing strong research activity, including PhDs, and research bids

(including FP7 bids) around games to help position Malta for new opportunities in future given the fragmenting and expanding nature of games.

Nurture a games eco-system: As Malta's games industry expands the expectation is that the local games business ecosystem will become self-sufficient reducing the need for strong local incentives from ME and other organisations, however it is worth noting the fiscal incentives to attract foreign companies to join and fuel that ecosystem will need to be generous for over 5 years as can be seen from the experience of Canada (Quebec) and other territories.

Games Areas for Malta to Specialise in: Based on research performed under this report, the best areas to focus on are Mobile, Tablet, PC, Console-Downloadable (e.g. Xbox-Live / Playstation Network), Casual, Flash and other browser games which require smaller teams. This sector of games includes the growing areas of Freemium and Microtransaction games. Development of these games can also be aided by distributed working by team members across different territories. The existing expertise in player behaviour analytics, data mining and statistical analysis in Malta, gained from the iGaming industry, are skills directly needed for games development and support in these areas. For reference there is a worldwide demand for these player analytics skills so would be viewed as a positive and could help attract foreign companies to locate in Malta.

Given that console development teams for full console boxed games need to be very big, often 100 people plus, this will be a hard area to secure business unless a company is prepared to relocate an entire team to Malta. The issue of the current small man power pool in Malta with games expertise would be viewed as a risk by a large publisher for the development of boxed product console games in Malta. In addition there are indications (as covered in Chapter 2), with the exception of major releases from established brands of boxed products such as Call of Duty and Assassins Creed, that this may be a gradually declining sector in comparison to the increase in sales of smaller Mobile, PC, Console-Downloadable (e.g. Xbox-Live / Playstation Network), Casual, Flash and other browser games, exemplified by titles such as Rovio's Angry Birds and Zynga's Farmville.

In the short / medium term Malta has the potential to be a European games sales / support centre but for most large publishers such as EA (Electronic Arts) Malta tends to be grouped as a smaller sales territory under Italy / Southern Europe so corporate re-organisation would be required at the publisher to get the maximum leverage on opportunities with publisher executives at a senior level. In the short term encouraging localisation, Q+A, and service companies to locate in Malta would be sensible given Malta's language breadth as would providing outsourcing of coding to European games companies. This strategy also creates the service rich foundations which will help attract companies later. Over the next three to five years, Malta's position near the emerging North African and Middle Eastern markets, particularly for mobile games, could be make it an attractive management, localisation and marketing / sales support centre location for games publishers for those territories.

Though Malta has good internet connectivity, the specific nature of two categories of gaming: video stream-based games-on-demand (provided by such companies as OnLive and Playcast) and synchronous multi-player gaming (such as the large scale MMOGs such as World of Warcraft) including limited multiplayer online games, (such as Battlefield 2) where games hosting servers need to be very close to centres of high population density makes these less attractive options for Malta to focus on as hosting centres for servicing Europe.

MALTA Games Industry Time Table. 3 Year Plan.

Date.	Games Sector Targeted.	Support Measures /Incentives	Start Up Stimulation Measures	Press Activity / Announcements	Education	Research	Marketing / Sales Activity.	Organisations/ Trade Bodies/ Events.
Q1 ***2012***	Small / mid size mobile, tablet browser and XNA type Games companies and Support, QA, localisation companies.	Existing Incentives maintained and in all subsequent quarters. (See Section 8.1). Start planning the new "Conversion Scheme": As detailed in Section 8.1).	Maintain and expand the Prototype grants of up to €25,000. (Similar to Abertay grants). See Table 8.2.1. The loan guarantee scheme currently provided by the Maltese government should be optimised to reduce the delays and individual risks that are currently suppressing take-up by both companies and banks. (See Section 8.2.1).	World Wide Press Release issued highlighting existing incentive packages.	Design Specialist Short Courses. (Selected from Appendices Table 8.11b Course Recommendations) Expand support for the Game Dev Challenge (run by St Martin's) and Gamezing Establish Prize €25,000 for the winning entry to develop and commercial the winning game. (See Table 8.2.1)..	Research Skills Based gaming opportunities and technologies. (See Section 8.5). Research Cultural Tax Credits and R+D Tax Credits in other territories for later potential implementation. Research Hotdesk / New business Incubator models. Including visits to relevant organisations for later implementation. (See Table 8.2.1).	Shortlist 5 companies for Games Sectors targeted in each of the main games industry countries to approach for meetings at E3 Conference in June 2012 (including Far East).	Organise affiliate membership with TIGA (Game Development Trade Body in the UK) or IGDA (USA). See Section 8.2.1).
Q2	Same		Promote and raise awareness of the recently established tax credit for VCs or angels to provide early stage risk	Press release announcing Malta annual Angel / Investor Games and Interactive Entertainment Networking Day		Research Cyber Security opportunities and technologies. (See Section 8.5).		Organise in Malta an annual Angel / Investor Games and Interactive Entertainment Networking Day

Date.	Games Sector Targeted.	Support Measures /Incentives	Start Up Stimulation Measures	Press Activity / Announcements	Education	Research	Marketing / Sales Activity.	Organisations/ Trade Bodies/ Events.
			capital for new companies to encourage private finance into games companies. (See Section 8.2.1).	(See Section 8.2.1).		Research Virtual goods and Taxes opportunities and technology. (See Section 8.5).		including inviting Angels from Europe including (e.g. from Noah, HackFWD). (See Section 8.2.1).
Q3	Same.	Cultural Tax Credit goes live if earlier evaluation work is positive (See Section 8.1.2). "Conversion Scheme Incentives" goes live (as detailed in Section 8.1).		Issue press release/s announcing:- 1. Cultural Tax Credit going live, 2.Conversion Scheme Incentives. Going live. 3.Malta delegation attending E3 games conference in LA.	University, St. Martins with MCST push to achieve European Research bids (eg.FP7) linked to games and related technologies and in subsequent quarters. Malta University and St. Martins push to publish technology focussed papers on games and interactive entertainment.	Research Mobile Broadband and 4G opportunities and technologies. (See Section 8.5).	Malta Delegation attends E3 Conference in LA. USA in June. (See Table 8.2.1).	ME give release small grants for regular (i.e. monthly) networking events for games and other creative media companies, paying for visiting specialists to visit. Could be an extension of the scheme offered by the Malta Film Fund. (See Section 8.2.1).
Q4	Same.		Company Start-up grants of €25,000-€50,000 to help new companies	Press Announcements announcing	Specialist games related Short Courses (Art and technical) in (e.g.	Evaluate Internet Connections to North Africa		Create international advisory board meeting for

Date.	Games Sector Targeted.	Support Measures /Incentives	Start Up Stimulation Measures	Press Activity / Announcements	Education	Research	Marketing / Sales Activity.	Organisations/ Trade Bodies/ Events.
			cover costs of founding the company provided via a start-up fund valued at roughly €1,000,000 over 5 years. See Section 8.2.1.	1.Specialist Games Course (Art and Technical) going live. 2.Establishment of international advisory board meeting for exciting "TechHub like" Incubation and Hot Desk facilities. (See Table 8.2.1).	LLVM and HTML5) go live. (Selected from Appendices Table 8.11b Course Recommendations and Section 8.3.1).	technologies. (Likely part of wider research).		exciting "TechHub like" Incubation and Hot Desk facilities. (See Table 8.2.1).
Q1 2013	Same		Enhanced Loan of Highly Qualified Personnel scheme to deliver short term to bring in games experts. Goes Live. (See Section 8.2.1).	Issue press releases announcing:- A)Two dedicated games courses BA +BSC going live.	2 Dedicated Games course go live. A Programming BSc Course s +A BA Games Art Course go live at Academic Institutions, (See Section 8.3.1).		Malta Delegation attends GDC Conference in SF. (See Table 8.2.1).	Official Opening of BA + BSc New Courses.
Q2	Same				Subsidise internships between games degree students and local games companies, (e.g. like in UK and US games degrees. (See Section			

Date.	Games Sector Targeted.	Support Measures /Incentives	Start Up Stimulation Measures	Press Activity / Announcements	Education	Research	Marketing / Sales Activity.	Organisations/ Trade Bodies/ Events.
					8.3.1). Malta University, MCAST and St. Martins push to publish art and creative focussed papers on games and interactive entertainment.			
Q3	same			Press Release announcing the official opening of "TechHub like" Incubation and Hot Desk facilities. (See Table 8.2.1).	Establish a university twinning scheme that links Maltese universities with best-of-breed games degree courses (eg Abertay University). (See Section 8.3).			Official Opening building of "TechHub like" Incubation and Hot Desk facilities. (See Table 8.2.1). Organise the second Malta an annual Angel / Investor Games and Interactive Entertainment Networking Day including inviting Angels from Europe including (eg. from Noah, HackFWD). To be held at newly opened

Date.	Games Sector Targeted.	Support Measures /Incentives	Start Up Stimulation Measures	Press Activity / Announcements	Education	Research	Marketing / Sales Activity.	Organisations/ Trade Bodies/ Events.
								"TechHub like" incubation and hot desk facility.(See Section 8.2.1).
Q4	Large corporations attracted by Malta North Africa marketing / sales position. (including large scale console and MMO Development) (See Section 8.1.1). ALSO Continue targeting: Small / mid size mobile, browser and XNA type Games companies and Support, QA, localisation companies.	Bi-Lateral Incentives package for large corporations Go live. (See Section 8.1.1). Potentially coinciding with the North African Markets opening up particularly around mobile and tablet games.		Press Release announcing Bi-Lateral incentives packages for large corporations using emerging North African markets as central component. (See Section 8.1.1).		Research University / Business Research models including UK TSB Technology Strategy model for later implementation		

Date.	Games Sector Targeted.	Support Measures /Incentives	Start Up Stimulation Measures	Press Activity / Announcements	Education	Research	Marketing / Sales Activity.	Organisations/ Trade Bodies/ Events.
Q1 2014	Same	Full range of Support / Measure incentives now in place and settled.	Public or joint public/privately funded venture or IP fund (e.g. UK's Nesta) invests in high risk businesses providing low interest, convertible loans go live. (eg €150,000 per annum). See Section 8.2.1).	Games Industry focussed Press Release announcing Senior Delegation at GDC Conference in SF, USA.	Subsidised internships between games degree students at the University, St. Martins, MCAST and local games companies, such as commonly found in UK and US games degrees go live. (See Section 8.3).	Commission New Strategic Research Review evaluating world wide developments over the past 2 years to ensure Malta overall strategy is still correct.	Senior Malta Delegation attends GDC conference in SF, USA promoting and meeting Malta's Bi-lateral incentives announced Q4 2012. (See Table 8.2.1).	Salaries for Art, Modelling, Animation and Design instructors for courses linked to Computer games and animation at MCAST uprated to be line with average salaries for at other European and USA universities. (See Section 8.3.1).
Q2	Same	same	Full range of Start Up Stimulation Measures now in place and settled		Subsidise distance learning initiatives (eg.Train2Game) could prepare generalist students for games production. (See Section 8.3).		Malta Delegation attends E3 Conference in LA. (See Table 8.2.1).	Organise the third Malta an annual Angel / Investor Games and Interactive Entertainment Networking Day including inviting Angels from Europe including (e.g. from Noah, HackFWD). (See Section 8.2.1).
Q3	Same	Same	Same	Press Release announcing	Educational / industry cross-			

Date.	Games Sector Targeted.	Support Measures /Incentives	Start Up Stimulation Measures	Press Activity / Announcements	Education	Research	Marketing / Sales Activity.	Organisations/ Trade Bodies/ Events.
				Industry Cross Over Grants. (like UK's TSB). (See Section 8.2.1)	over grants (e.g. UK's TSB[2]) valued at €100,000-€250,000 to encourage closer collaboration on technology development with universities in Malta go live. (See Section 8.2.1)			
Q4	Same	Same	Same		Full Range of Educational courses and grants now settled.			

Table of Contents

Chapter 1: Malta and the Industrial Context

Lead Authors: Gordon Calleja, Jeanine Rizzo, William Latham.

1.1 Introduction

1.1.1 Aims and objectives of the consultation

This report has been produced for Malta Enterprise to guide national policy in setting up a digital games industry in Malta by presenting a strategy for building a games industry that can both attract inward investment and nurture an indigenous games sector.

An important part of this report is to aid Malta in forming a strategy to develop a cluster of game companies both by growing its indigenous talent and by attracting existing companies to its shores which will contribute, in the long run, to the growth of the Maltese economy. The report will enable Malta Enterprise to understand what conditions are required on the ground for global games companies to consider locating offices and studios in Malta, and what incentives would best target such companies and their requirements.

The report will provide an overview of the current local situation in Malta and will compare and contrast this with selected major digital games development regions.

Lastly, the report will make recommendations and propose action plans that will in both the medium and long term build an eco-system in Malta to grow its digital gaming sector.

1.1.2 Methodology

The methodology used to produce this report included Games Audit using its own expert in house staff combined with a number of industry experts from the UK and USA. Standard research methods such as comparative analysis, gap analysis, and modelling were used to build on conclusions from important face to face interviews. Gordon Calleja and William Latham spent considerable time in Malta in July and August carrying out local audits and interviews. A further two research visits to Malta were performed by William Latham in November and December to obtain further information for the Local Audit. The help of Maltese companies interviewed was much appreciated and local audit work was supported by Jeanine Rizzo from Fenech and Fenech Advocates.

The International consultations included interviews with leading games industry figures at the E3 Games Conference in Los Angeles (the largest global annual games conference) in May, the Develop Games Conference (the leading European Games Conference on casual and mobile games) in Brighton, UK in July and The Osborne Clarke Interactive Entertainment Summit in December in London. Other interviews, such as with major game publishers, were secured through the teams personal contact network. Work by Rick and Nick Gibson, in addition to looking at games industry trends, included analysis of existing fiscal incentives such as tax incentives offered by other territories to attract games companies. A range of countries were analysed and evaluated including Canada (Quebec), Singapore and France with the purpose of identifying specific fiscal incentives offered that Malta could choose to adopt or adapt.

See Appendix 1 for details of interviews carried out while compiling this report.

1.1.3 Definitions

Definitions of terminology will be given where appropriate at the start of each chapter.

Remote gaming: Gambling games and services where players can bet on and withdraw money after playing, games of chance on the internet. Remote gaming is regulated in most territories.
iGaming: As Remote gaming.
Digital gaming: Unregulated games of skill and chance played on multiple platforms (such as consoles, mobile phones and PCs) typically involving either no gambling, no cashing out, or neither.
Gaming: As digital gaming.

1.2 Background

1.2.1 Digital Game Production and the Maltese Industry

Malta has been progressively moving to a diverse higher value added economy driven by being able to provide a regulatory and fiscal framework that is attractive for inward investment in new economic sectors along with a well-educated and highly skilled workforce able to service these new industries.

In the past Malta's economy had revolved on its role as colony and safe haven for the military and mercantile fleets of the colonising power. For a long time Malta was a centre for trade, ship repairs and a manufacturing industry based around these two. Even agriculture was influenced by the material necessities of ship repairs; cotton and hemp were grown so as to supply the raw material for sails and ropes. This strategic importance reached new heights during the British rule from 1800 onwards with an unprecedented high-point arriving with the opening of the Suez Canal.

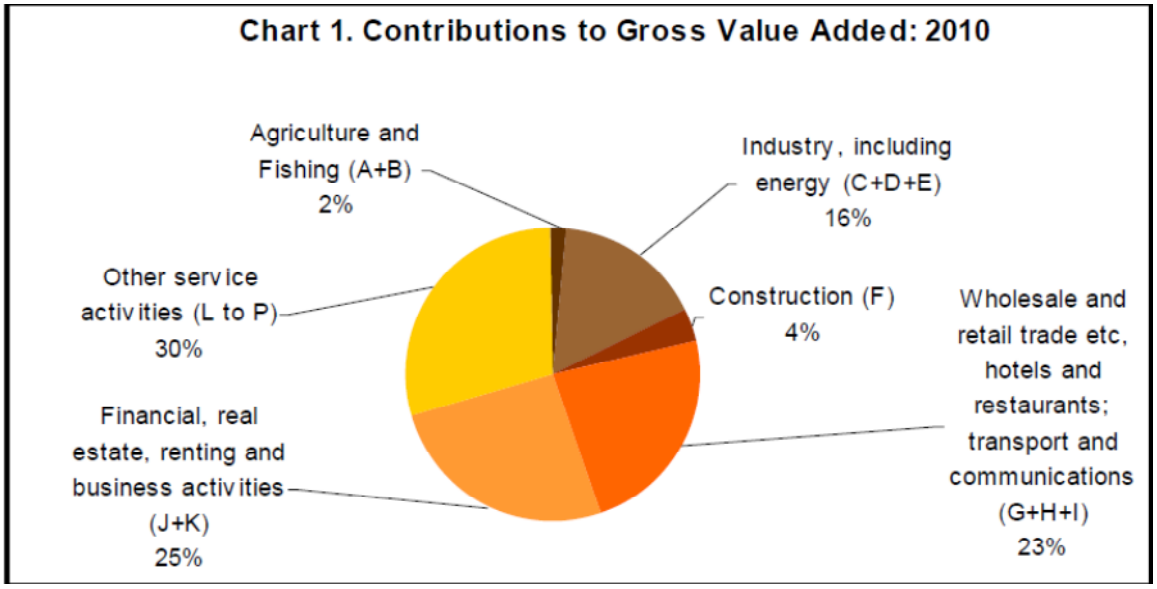
Various factors pertaining to the new geo-politics of the post-war period and the advances in aeronautics brought with them a decline in the military and trading importance of Malta. This trend continued until finally Malta gained Independence in 1964 and later when Malta renounced its role as a NATO naval base in 1979. These required a change in the Maltese economy since it couldn't continue depend on income from military support. The role of the Malta Drydocks and Shipbuilding shifted towards commercial shipping and Malta promoted itself as a manufacturing base able to offer competitive labour costs while being geographically suited as an export hub. The 1960's and 70's also brought with them the beginning of the Tourism Industry which was to become central to the Maltese economy. Malta has a rich industrial history where sectors such as electronics, precision mechanical/metal engineering services, health and plastics have been successfully providing the backbone of the Maltese economy. In the productive sectors plus ICT more than 25,000 people are employed currently.

From 1987 onwards Maltese economic policies were influenced by Malta's resolve to join the European Union and after that to meet the Maastricht requirements so as to be part of the Eurozone. Although there were other influences, like the rise of globalisation and the repercussions brought about by the 9/11 attacks, these were the main driving forces that made Maltese industries go through changes and restructuring.

The lack of natural resources and the availability of cheaper production costs elsewhere meant that the Maltese economy had to focus mainly on high value added industry and services, such as those offered by the financial sector, and business-related, service activities By 2009 Financial Intermediaries were contributing up to 6% of the Maltese GDP. Other industries, like real estate and

hotels, rely highly on foreign companies opening offices in Malta and this contribute up to 22.8% of Malta's GDP.

Although Malta has also been successful in attracting highly skilled manufacturing activities, mainly pharmaceutical production and aircraft maintenance, this hasn't stopped the general decline of manufacturing industries. This led to the initiative to create in Malta a hub of IT excellence able to attract large foreign projects like SmartCity.



The strategies adopted, together with the fact that Malta is part of the single market have proven to be successful. Except for 2009 recent years had a positive real growth in GDP. This means that unlike other EU countries in the region (Portugal, Spain, Italy and Greece) the Maltese economy is in a healthy state and is recovering from the economic recession that has badly affected many other economies.

Year	GDP real growth rate
2007	3.8%
2008	1.6%
2009	-1.9%
2010	3.7%
2011[3]	2.3%

Various factors and initiatives have allowed Malta to become one of the most attractive locations for foreign financial services and ICT companies:

- the adoption of the Euro in 2008
- effective tax incentives including tax credit allocated for R&D
- a legislative framework that is in line with the main EU directives
- an excellent ICT infrastructure that is essential for all businesses
- the availability of a skilled, qualified and multi-lingual workforce

[3] The results for 2011 are based on the estimates for the first quarter of 2011 as published by the National Statistics Office. On the other hand forecasts indicate that 2011 as a whole will not be as successful as indicated by the first quarter due to the ongoing Libyan crisis.

- an international banking system with various primary international banking institutions present on the island
- an ongoing programme towards the elimination of excessive bureaucracy

Part of Malta's recent economic success is related to the rapid and steady growth of remote gaming (also known as iGaming) industry in Malta. The first remote gaming companies started in Malta in the year 2000 and during the span of one decade Malta has become a major hub for this industry. Today we find that over 10% of the world's remote gaming companies are present in Malta; in fact this has led the EU Commission to describe Malta as 'Europe's Gaming Hub'. Remote Gaming has contributed to 7.82% of Malta's GDP and currently directly employs over 2,000 people.

The present experience with Remote Gaming companies shows that with the right framework and with concerted action Malta can attract new industries and tap into new possibilities.

1.2.2 Recent Policy Reforms: Remote Gaming

Malta is currently the most popular jurisdiction where iGaming operators decide to set up operations and provide their services to customers Europe-wide. It is interesting to point out that the reason why Malta found itself at the forefront of the remote gaming industry, is primarily attributed to the fact that it has a solid and serious regulatory regime based on a set of regulations which ensure that iGaming is provided in a fair, responsible and transparent manner, free from crime and money laundering. Furthermore, this legislative framework also includes all the necessary accountability measures, particularly aimed at protecting minors and vulnerable persons (Malta Remote Gaming update 2010).

Malta has proven to be proactive in its bid to attract remote gaming companies towards its shores. This track record goes back to the year 2000 when under the Public Lotto Ordinance (Legal Notice 34 of 2000) offshore betting offices were regulated and therefore betting companies could start operating from Malta. Then in April 2004 Malta published the Remote Gaming Regulations, making them the first of their type to exist in an EU country.

When creating the 2004 regulations the LGA identified the fact that iGaming companies offer different services and that therefore licences and taxation had to be specific to the actual activities and nature of services provided. In its regulations LGA has identified four main categories and spheres of activity and products provided. The first two types of operators offer B2C (business to customer) services; the first type of operators offer games of chance like casino games and the second type offer the facility to place bets on sporting events etc. The other two categories are of a B2B (business to business) nature, companies that offer services of promotion and assistance for iGaming from Malta and companies which offer hosting services to remote gaming operators (excluding themselves).

Taxation is also worked out according to the type of licence the operator holds. The Maltese taxation system has not only attracted remote gaming companies because of its flexibility in relation to services provided, but also because it offers advantageous rates compared to other EU countries. For example UK based betting companies have to pay 15% on their daily betting profit, in France they pay 7.5% on all betting transaction whilst in Malta they pay 0.5% on all betting transactions. Malta is also attractive for professional poker players; unlike other EU countries like Sweden and Germany, in Malta there is no withholding tax on the winnings of a player.

Apart from advantageous iGaming tax rates Malta also offers a host of financial benefits. These benefits are not only relevant to the Remote Gaming industry but are also extended to other types of direct foreign investment.

Malta also offers relief from Double Taxation of foreign source income by concluding treaties and agreements with over 40 countries, meaning that tax credit is offered for any tax paid in any of these countries. On the other hand if tax is paid in a country with which Malta doesn't have a treaty then Malta offers a unilateral form of relief that also applies for foreign tax that is paid by the company on the distributed profits.

As a member of the Commonwealth, Malta also offers income tax relief if the taxes were paid to British Commonwealth countries. If a company cannot apply for any of the above-mentioned circumstances then it is offered the possibility of availing itself of a flat rate of 25% on the amount of overseas income received by the company before any deductions.

Malta also offers tax refunds on the dividends that are paid to company shareholders. This is a move towards attracting larger companies. In its bid to attract foreign investment in the Ministry of Finance had also initiated the 'Residents Scheme'. This was created in 2004 and offers an income tax benefit of a base rate of 15% on income that is made or brought into Malta. Presently this scheme has been temporarily suspended and is not on offer.

Malta Enterprise also offers various forms of aid to support companies and enterprises most notably the investment aid that is offered to companies that are part of specific industries that are being promoted in Malta. Eligible companies have to fall under these specific categories;

a) Manufacturing
b) Information and Communications Technology (ICT)[4]
c) Research, Development and Innovation
d) Eco-innovation, waste treatment and environmental solutions
e) Bio technology
f) Facilities for Filming and Audiovisual productions
g) Provision of Tertiary Education in Science and Technology
h) Provision of Private Health Care Services
i) Logistics operations by large undertakings

Digital Games enterprises would fall under categories b) ICT and c) Research, Development and Innovation.

This investment aid takes the form of tax credits that are equivalent to a percentage either of the value of capital investment or the value of 24 months of wages of new jobs that have been created by the new investment. This initiative is applicable to investments made from 1st January 2008 till 31st December 2013 when aid activity will be highest but the framework will still be in place beyond 31st December 2013.

1.2.3 Future Directions: Cultural and Creative Industries

The Maltese economy today is becoming increasingly more dependent on its ability to diversify its economy towards high value added industries which can generate a higher rate of return than other industries. The Culture and Creative Industries offers great opportunities in this respect. Economic indicators reveal that the cultural and creative industries (CCI) in Malta contribute to around 4% of GDP with an upward trend throughout the period 2004-2010 and a growth rate of 13% in 2010

[4] This category excludes Remote Gaming (betting) companies and Providers of Telecommunication Services, in other words any companies that fall within the categories NACE rev 2 class 92.0 and NACE rev 2 classes 60.0 and 61.0 respectively. http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-RA-07-015/EN/KS-RA-07-015-EN.PDF

alone. Around 4000 enterprises are operating in these sectors with 4% of the labour force, equivalent to 7000 individuals, registered as professionals in the CCIs. Total employment (full-time equivalent) in the sector was also increasing over the period of 7 years till 2010 at an annual average growth rate of around 4%.

In January 2010, the Ministry of Finance, the Economy and Investment established a working group to conduct extensive research on the cultural and creative industries in Malta with the remit of developing a strategy for the creative economy. The working group defines the creative economy as a set of knowledge based economic activities (creativity and intellectual capital) that encompass the cycles of creation, production and distribution of creative goods and services, and which have the potential to generate economic growth, employment and development (social and cultural). The pillars of the creative economy are the cultural and creative industries: Heritage (crafts, antiques, cultural sites, traditional festivals and celebrations) Arts (visual arts, music and performing arts), Media (publishing, audiovisuals and digital games) and Creative business Services (design, software, architecture, advertising and cultural services).

Following extensive industry consultation, Government has committed itself both nationally and on the European level to develop the creative industries as one of the pillars of the economy. The National reform Programme, agreed to by the European Institutions, states the following:

> *Malta is currently developing a national strategy for the cultural and creative industries. The strategy prioritises 4 pillars: education and professional development; route to market; internationalisation; and governance. In addition to this initiative, the 2011 Budget announced 7 new initiatives and programmes to address the immediate needs of the CCIs namely in the field of training and education, audience development and CCI financing mechanisms to leverage private investment. The aim of the strategy is consistent with the vision of Malta's new cultural policy in transforming the cultural and creative sector into the most dynamic facet of Malta's socio-economic life in the 21 century, with the first national milestone being the hosting of the European Capital of Culture in 2018.*[5]

The Maltese Government is committed to delve deeper in the digital world and is presently probing how to establish Malta as a centre of quality in digital game production. This is a continuation of the strategy that Malta Enterprise has embarked upon in recent years: that of focusing on very specific niches and gradually building and infrastructure to promote Malta as a centre of quality in the particular niche.

In view of the above, Malta has embarked on a process of exploring the potential of developing the digital games industry. This has seen the formation of a Digital Games Working Group bringing in contributions from the University of Malta, Malta Enterprise, the Malta Council for Science and Technology and the Creative Economy Working Group. Furthermore, and consistent with the objective of developing a creative ecosystem in Malta, fiscal incentives are being developed to ensure that both locally-based and international operators in the creative economy can benefit from favourable start-up and setting-up conditions.

The global digital games industry is a major economic force that has exceeded media giants like the film and the music industry in recent years. Malta is already home to a budding digital media sector with a pool of quality employees and students who possess the specialized skills needed for designing

[5] http://ec.europa.eu/economy_finance/sgp/pdf/20_scps/2011/01_programme/mt_2011-04-28_nrp_en.pdf, p. 39. Accessed on 18th July 2011.

games and related products. The news in November 2011 that TRC Family Entertainment Ltd headed up by veteran industry leader Chris Deering locating in Malta and associated generation of 100 jobs over 2 years is an exciting development and gives an indication of the exciting direction Malta is taking and should help serve as a catalyst for further FDI activity.

Chapter 2: Industrial trends and opportunities

Lead Authors: Rick Gibson, Nick Gibson.

This chapter introduces the global games industry with a brief history, market values and trends. It then gives an overview of games genre history, trends and market impact (from entertainment genres to gamification and serious games), profiles 6 major sub-sectors of the games industry, lists the main international locations of digital game production and operation and summarises some cultural and social benefits of games.

Definitions

MMOG: Massively multiplayer online game, a browser or client-based game that supports hundreds or more concurrent players in a shared virtual world.
MMORPG: An MMOG with role-playing gameplay.
ARPU: Average revenue per (paying) user, typically given as a monthly measurement.
ARPPU: Average revenue per (paying) user, typically given as a monthly measurement.
DAU: Daily active user.
MAU: Monthly active user.

2.1 Industry history and introduction

2.1.1 Brief history of the industry

Origins

Whilst academic and military experiments in electronic gaming were conducted as early as the 1940s, the commercial games industry originates in the 1970s with the launch of the first coin-operated arcade games most notably Atari's Pong (1972), Taito's Space Invaders (1978) and Namco's Pacman (1980). Their huge commercial success inspired the development of video game hardware for use at home and during the 1970s and early 1980s a succession of predominantly US console manufacturers launched around a dozen different games platforms, the most successful of which was the Atari 2600.

The console boom (and bust) era

Although arcade games remained popular, the global games industry in the 1980s and 1990s was dominated by TV-based and handheld consoles made by Japanese companies (Nintendo, Sega and Sony) that powered a global boom in video gaming. As the market became dependent on a small number of major platforms, the industry's growth during the 1980s and 1990s proved highly cyclical, following the shelf lives of the individual games platforms. The growth years of a typical 4-6 year cycle were spectacular but were matched by the periods of stagnation and decline between console generations that damaged many games companies including Atari in the mid-1980s. Nintendo and Sega established gaming as a major new consumer media market, but Sony's 1995 PlayStation changed the shape and commercial dynamics of the market. Sony revolutionised the economics of console games publishing through cheaper and more easily manufactured CD-ROM technology, moved the industry's focus from children towards more affluent young adults, and dramatically extended the console lifespan using price management and international distribution. With PlayStation and PlayStation 2 (2000), Sony dominated the games industry for over a decade selling over 100m units of each.

The 1980s and 1990s also saw the birth and rapid growth of a computer games industry. In the 1980sthis market was fragmented and comprised a range of computer platforms (such as the Sinclair Spectrum and Commodore Amiga series) which were, commercially, very similar to dedicated games consoles in being largely closed standards with finite shelf lives. The computer games market coalesced in the early 1990s around a single standard, the Microsoft operating system-powered PC. Based on a constantly evolving technology base, PC gaming's more linear growth increasingly smoothed the console market's cyclicality and contributed strongly to the industry's overall growth.

The rise of network gaming

Originating in the 1980s on some of the earliest computer and console platforms, by the late 1990s and early 2000s network gaming had become a viable commercial market of material size. Mobile gaming, online PC gaming, network-based games distribution and online console services have evolved at a frenetic pace over the last 11 years resulting in an explosion of innovative new platforms, business models, games genres and distribution methods. Network gaming triggered unprecedented fragmentation of the games industry after decades of consolidation and inspired the creation of thousands of new games companies. Closely linked to significant demographic expansion, online gamers added older females to the traditional younger male core console demographic.

While network gaming grew through the 2000s, the console market also continued strong growth. Nintendo, a fading light in the TV-based console market but the long-term market leader in handheld gaming, revitalised its fortunes with the hugely successful launch of the Wii (2006). Like the first PlayStation, the Wii represented a radical departure from the norm by prioritising user interface innovation over technological sophistication combined with unconventional software design and marketing to casual gamers of all ages and both genders.

The present

The network games market continues to grow strongly and many see the present as a golden era for new games company and intellectual property creation. Although it has embraced some of the innovations from network gaming with download services like Xbox Live Arcade and the PSN Store which have met with modest commercial success (compared to PC download services), the console games market continues to follow its traditional cyclical pattern of growth with Nintendo's Wii in decline following its 2008 peak dragging the overall console games market down despite the solid growth in PlayStation 3 and Xbox 360 software markets over the period. Both Sony and Microsoft have attempted to add longevity to their consoles with the launch of proprietary motion control peripherals (Kinect for Xbox 360 and Move for PS3) in the last year. Although they have achieved strong hardware sales, sales of software for these peripherals has been relatively weak due to low quality levels and a surprising lack of innovation. A new generation of games consoles beckon with Nintendo having announced its Wii U console (2012) and both Microsoft and Sony hinting at their next consoles (widely expected between 2013 and 2015). While the console market suffers mixed fortunes, PC gaming continues to boom thanks almost entirely to network gaming. Massively multi-player online games (MMOGs), sophisticated digital distribution services (such as Steam and OnLive), social network gaming and a host of casual games services are expanding both the appeal and value of PC gaming.

2.1.2 Overview of games industry

The global games industry is one of the fastest growing media sectors and compares very favourably with most other entertainment media's market growth profiles over the last decade or so. While the games software market has more than doubled in size since 2000[6], the global music industry has

[6] Source: GIC, 2011

almost halved[7] and the North American cinema box office has seen admissions fall by over 6%[8]. The games industry has 2 major components, hardware and software, as well as a significant support services sector. Hardware comprises dedicated gaming platforms from Nintendo, Sony and Microsoft as well as non-specific hardware platforms such as PCs, Macs, iPhones and other mobile phones, and tablets. Software developers and publishers create and distribute games titles and services across all these games platforms although few have the resources or inclination to cover every platform. The software market can be divided between retail (e.g. boxed console and PC games) and the many sub-sectors of network gaming, most of which have different value chains, growth characteristics, demographic target markets and market leaders. The main sub-sectors of the games software market are as follows:

- **Console, handheld and PC boxed product:** High street and online retail of boxed games and the digital distribution of their equivalent over networks.
- **Mobile and tablet:** Games software and services sold for mobile phones including standard Java-based handsets, iPhones and other smartphones as well as tablets such as the iPad.
- **Casual online games**: Simple, short-duration PC games aimed at mass-market demographics via casual games portals and download services.
- **Massively multiplayer online games (MMOGs) and virtual worlds**: Online games supporting hundreds or more concurrent players in a constantly available, shared virtual universe.
- **Social network games:** Games designed specifically to operate on social network platforms such as Facebook.
- **Services:** The provision of support services to all parts of the games supply chain from development to publishing and distribution.

2.1.3 Games business models

The major consumer (B2C) business models employed in the games industry are as follows:

- **Retail of physical products**: Games are created by specialist games development studios, financed and marketed by publishers who are also responsible for manufacturing, distributing, promoting the games and selling them in to high street and online retailers. Highly hit-driven, successful performance often results from big brands or sequels, strong retailer support and traditional marketing campaigns. Games retail for between $10-$60 depending on the games platform.
- **Network retail:** Network retail represents the sale of downloadable games products and is largely confined to casual PC, console and mobile games often sold on a try-before-you-buy basis for $0.99 (mobile) to $20 (PC). Larger PC games (targeting a hard-core player and selling for up to $50) are also available but are hampered by a slowing supply of games and competition from subscription and microtransaction MMOG services. The network retail of large-scale console games (which today generate the bulk of physical retail sales) is an inevitability but is almost non-existent at present and will not be realised in the next five years due to technical barriers and industry reluctance to disintermediate physical retailers.
- **Subscription**: These consist of monthly payments either to unlock premium features in titles with permanently free content (the 'freemium' model) or simply to continue playing a game or accessing a games service after a finite trial period. $10-$15/month subscriptions have remained

[7] Source: RIAA, Bain, 2011
[8] Source: MPAA, 2011

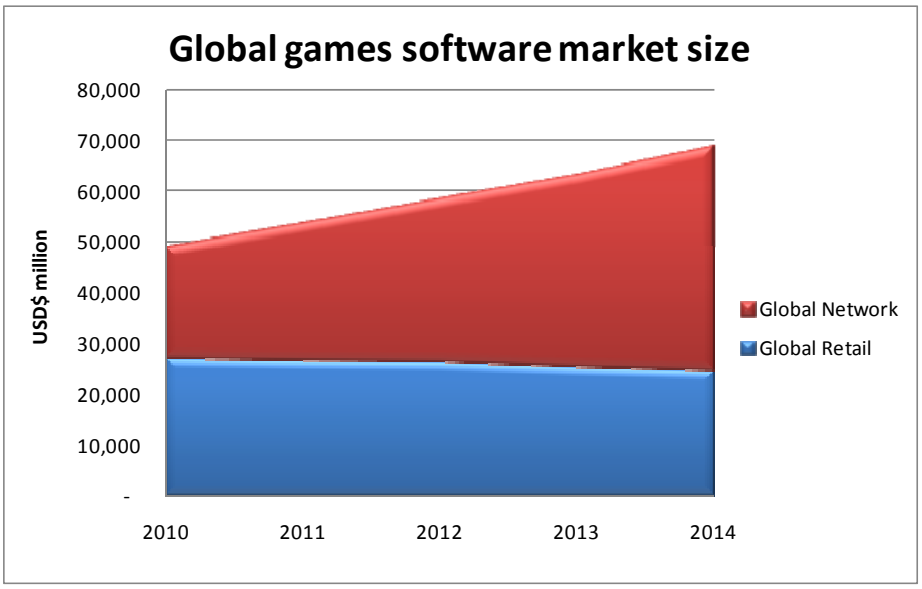
the standard for most big-budget western MMOGs such as World of Warcraft which target a predominately adult male player base. Lower priced subscriptions (typically $4-$10/month) have also become the norm for most MMOGs and virtual worlds targeting early teen and pre-teen children as well as many premium casual online games services. A variation on this found in some parts of Asia for certain titles is the time card model where players pre-pay for limited duration access to an online game. These time cards are sold with hours' or days' game access in shops and internet cafes.

- **Microtransactions**: This model enables players to acquire virtual currency with real money (either online or via pre-pay cards at retail) and choose from multiple purchase options that range from virtual items to limited duration power-ups and services. It is popular for many MMOGs, virtual worlds, smartphone and social network games. Mostly (but not exclusively) found in freemium games, microtransactions have become particularly popular for teenage and young adult players and in less affluent parts of the world where $60 console games are not available or affordable. The accessibility and resulting broad appeal of such games combined with the absence of an expenditure cap has resulted in some of the industry's fastest growing and most profitable companies.
- **Skill gaming**: With this model, players wager on their ability at a game versus either other human opponents or the 'house'. To adhere to gambling laws, chance must play either a minimal or zero role in determining the outcome of a tournament. Skill games services use pre-paid wallets into and from which players deposit and withdraw money. This value is either stored in real currencies or virtual currencies and operate much like microtransactions in providing players complete discretion over how the sums are spent. For every wager made, the skill games service provider typically retains around 15%-30% with the remainder being distributed to the winning player(s). Despite its commercial and legal proximity to gambling, skill gaming has rarely been undertaken by gambling companies themselves for two reasons: the demographic of skill gamers is radically different to that of online gamblers (older females vs. younger and older males), the conversion rates for free to paid play for skill gaming are significantly lower (rarely over 5%) and the typical lifetime value of paying skill gamers is a small fraction of that for online gamblers (in the tens of dollars vs. hundreds for online gambling). It should be noted that the gambling industry uses the term skill gaming more widely to denote any game that has an element of skill including those that are still legally classified as games of chance such as poker and backgammon. For the purposes of this report, we use our definition stated at the start of this paragraph.
- **Advertising**: Advertising drives the lower end of casual online games but for all other games types is typically only used to supplement revenue by placing advertising within or around games. In-game advertising for console titles are exemplified by advertising hoardings in racing games, whereas advertising in freemium MMOGs (particularly subscription-based ones) consists of regular advertising banners that monetise non-paying players. There are numerous variations on advertising such as 'offers' in social network games which allow players to acquire virtual currency in return for performing certain tasks such as installing an application or completing advertising offers.

Business to business (B2B) models employed by the games services sub-sector broadly fit into a small number of categories for which a huge number of variations exist. Licensing fees (per title, developer seat, company, month or annum) are common for technology services such as tools and middleware provision, revenue share agreements are particularly common for billing and distribution services whilst most of the rest charge either man-day rates or fixed fees for outsourced development, localisation and other services.

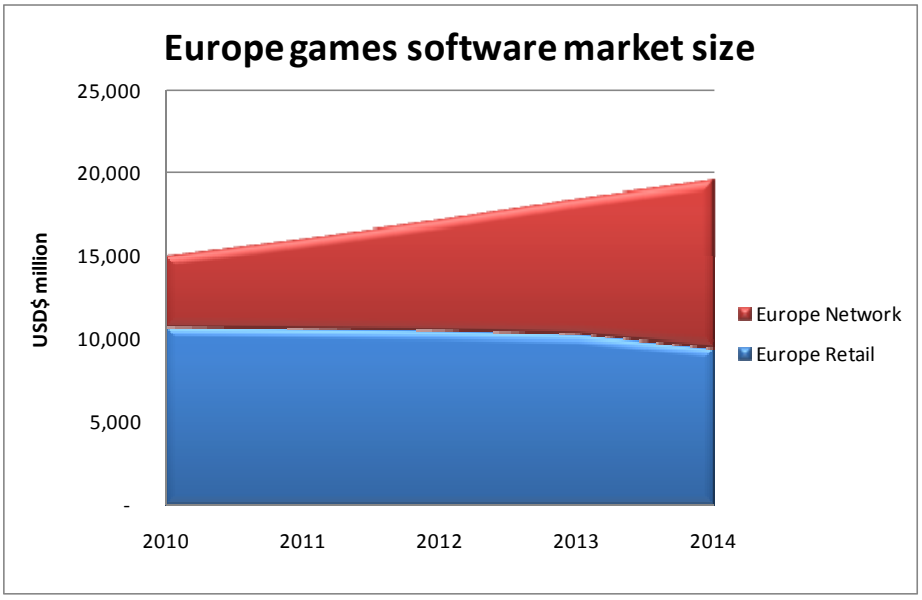
2.1.4 Games market size and forecasts

Below are four charts indicating the relative sizes of the retail and network games markets globally and then broken out for Europe, North America and the rest of the world (ROW). All historic and forecast market size data comes from Games Investor Consulting and is based on a very wide variety of industry sources.



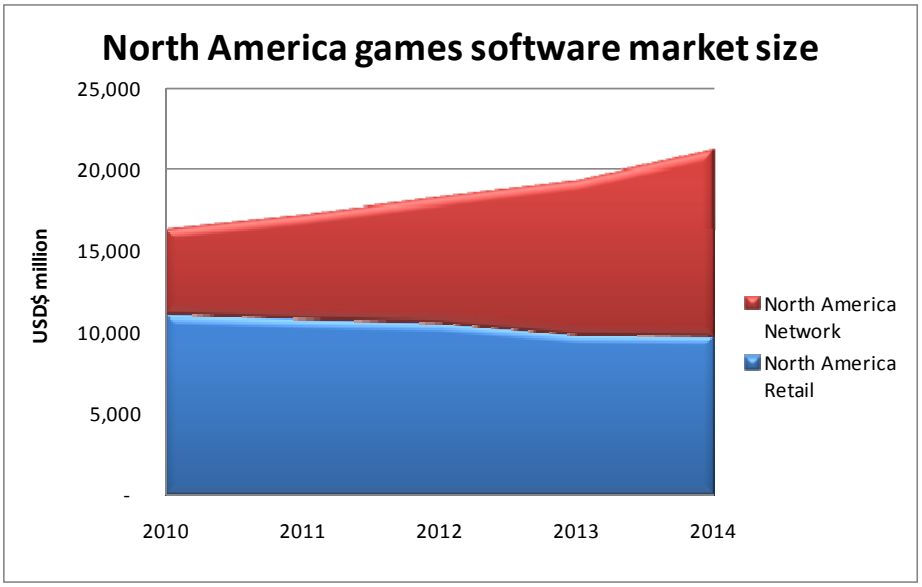
Source: Games Investor Consulting, Industry sources

The global games software market reached $49bn in 2010. more than doubling in size since 2005 due to substantial growth in both retail and network gaming. The global games software market is expected to experience a CAGR between 2010 and 2014 of 9%. However the global games retail market declined in 2009 and again in 2010 and is expected to continue to decline throughout the forecast period (CAGR of -3%) due to a combination of cyclical pressure and competitive pressure from network gaming. Network gaming (CAGR of 19%) will therefore drive overall growth in the industry.



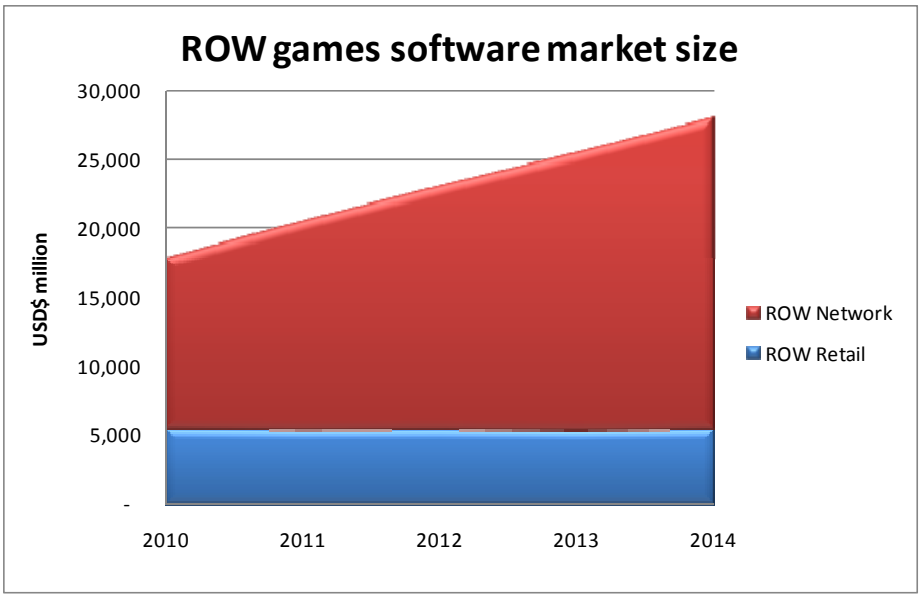
Source: Games Investor Consulting, Industry sources

The European games software market is characterised by radically different constituent countries' market profiles. The UK matches the make-up of the North American market in being highly retail and console focused, but other territories are more PC focused (such as Germany and central Europe) and many Eastern European territories have much higher relative network games market sizes. While Europe can boast a degree of strength in certain categories of network gaming (such as browser-based MMOGs), in many categories (such as social network gaming) it clearly lags behind North America and Asia. With fewer indigenous network games companies, the development of the European network games market is expected to be slower than that in North America (where innovation and access to finance are greater and more widespread) and in particular ROW (where network gaming has little competition from retail gaming and benefits from an exploding games playing population).



Source: Games Investor Consulting, Industry sources

North America (comprising USA and Canada only) has consistently proven the network games software market's lead innovator, originating many (but by no means all) of the industry's most significant evolutionary steps. Backed by a sizeable and eager investor community and the world's largest development community, North America has reaped many of the benefits of recent industry changes. However, despite this it has been slower to tap into the ROW and, to a much lesser degree, the European network games markets.



Source: Games Investor Consulting, Industry sources

The rest of world games software market comprises a huge number of countries but is dominated by Asia and China, Japan and Korea in particular. The retail games market is largely confined to Japan and Australia/New Zealand and whilst some emerging territories are seeing strong growth in retail gaming (mainly through legacy games console platforms), their growth is offset by the expected decline in the more mature territories. The Middle East is an example of an emerging market that is seeing solid games software growth at retail (up 10% in value to €150m in 2009[9]) thanks primarily to PS2 sales. However the majority of growth in most ROW territories is almost exclusively network games-based and many will never develop retail games markets of material size. The powerhouses in this market are Chinese and Korean online gaming (MMOGs and casual online PC games) and Japanese mobile gaming. With a population in the billions, the addressable market of network games players and commercial potential of the market in ROW (Asia, South America in particular but also the Middle East and, in the longer term, India and Africa) is colossal and has only really started to be tapped in the last few years.

2.1.5 Major trends

Below we examine some of the key trends impacting the current and future global games industry.

- **Ever-increasing console games publishing risks:** Average games development costs for leading edge consoles have increased significantly each generation as console hardware has increased in sophistication and users' quality expectations have risen. Good quality current generation (Xbox 360 and PS3) console games typically cost in the tens of millions of dollars to create and combined with ever-increasing marketing budgets, this has made console games publishing an extremely high risk business, although good returns are possible.

- **Steady shift to digital distribution:** Unlike the music industry's rapid and catastrophic transition to digital, games' transition from physical product to digital distribution is going to take a very long time, with retail games releases likely to persist for at least another decade. This is because retail represents half of the games market by value, console manufacturers, after some unsuccessful experiments (Sony's PSPGo) will continue to support physical media in all of their forthcoming consoles, on which games are too large for local storage (most consoles have

[9] Source: Catapult, 2010

120GB or less of space). Average bandwidth as well as bandwidth caps makes full game console downloads impractical for most users and the industry remains reluctant to disintermediate retailers on whom they completely rely for hardware sales.

- **Platform and market proliferation:** The games industry now supports a dozen major and more minor platforms, including 4-5 major consoles, 3-4 handhelds, many discrete sub-sectors of PC gaming, numerous mobile games platforms and several entirely new platforms (tablets, ebooks, smart TVs etc.), a substantial increase on the industry in the 1990s. The different user interfaces, form factors and technological standards on which they are based means that developing a single game to work in all corners of the market is extremely expensive. As a result, only Electronic Arts gets close to engaging in most aspects of gaming and companies must choose which platform and market to focus on.
- **Platform openness stimulates independent developers:** A side-effect of this proliferation has been the advent of open platforms for which, unlike TV-based and handheld consoles, anyone can develop and publish games. This openness has driven an unprecedented level of development company start-ups, who have been exploiting the opportunity with small, easily distributed and low risk projects without publisher oversight that are monetised directly with higher margins and retention of IP. The downside has been, on smartphones, that enormous competitive pressure means that average prices have raced to the lowest permissible price.
- **Demographic expansion:** The Wii (and to some extent the DS) are often credited with bringing about a major demographic shift in gamers but Nintendo simply accelerated a trend that had started many years beforehand by Sony who proved that family console gaming was viable. It also echoed the evolution of the online PC games market over the previous 6 years, which had expanded to encompass and service older female gamers. The result has been entire subsets of the online PC games market (such as casual PC downloads, casual browser games communities and skill games services) targeting older female players. The explosion in social network gaming has largely been driven by this same demographic and adult females (25-55) now represent the single largest demographic category of gamers online.[10]
- **The rise and rise of Asia:** Long the market-leader in consoles, Japan has been joined by Korea and then China as major international gaming territories with strong domestic mobile and online PC markets, increasingly exploited by indigenous games companies. Major new games businesses such as Nexon (Korea) and Tencent (China) have revenues to match many of the largest international console and PC games publishers and profit margins considerably larger. Combined with some of the high growth network games businesses in Japan such as DeNA, these new Asian powerhouses have begun to expand internationally via localised services, local offices and acquisitions. With substantial market capitalisations and extensive cash resources, Asian games companies will continue making inroads into the Western market.
- **Other untapped markets represent huge long-term potential:** While most other entertainment media (e.g. music and movies) already reach a significant proportion of the world's population, gaming has been confined to relatively limited sub-set of this. Many territories such as some African countries and India have little or no games industry of note but massive populations, some with growing middle classes, with an increasing ability and willingness to buy games playing platforms such as mobile phones and computers. If Asia, South America and the Middle East represent the short to medium term high-growth territories, Africa and India undoubtedly represent the long-term growth markets. However, we note that this games potential has been heralded by more optimistic analysts for well over a decade and their very slow growth compared to other developing territories (such as Latin America, Eastern Europe and Turkey) may result in this potential not being realised within the next 5 years.

[10] PopCap, 2010

- **International state aid competition:** As games have grown while more traditional entertainment media has declined, governments of some territories compete to attract games businesses to their region. Canada has led the way, with several provinces providing generous tax breaks and other support measures to local games companies and actively marketing to foreign companies to relocate or set up new offices there. As a first mover and also as the provider of the most generous subsidies, Canada has derived enormous benefits, taking it from obscurity to the fourth largest games development market in the world and prompting other territories to attempt to emulate them. This has created a highly uneven international playing field that has often left those with little or no support, such as the UK, both at a major disadvantage and facing continued decline.
- **Globalisation deepens:** Globalisation has had a number of impacts on the industry. First, the number of viable games territories for retail has been increasing, led by territories where the previous generation of console has reached the right price point for the market. Online games have reached strongly into markets where consoles have been slow to sell, giving rise to substantial games markets in Turkey, Brazil, Eastern Europe, and, to a lesser extent, the Middle East and south-east Asia. Development has become globalised as a number of territories (e.g. China, India, Hungary, Ukraine) that were formerly too immature for full scale games development become destinations for outsourcing of partial and, for some, full game development. Finally, global companies, mostly publishers, have been opening new divisions in new development locations. The companies leading this trend are Ubisoft, EA, Microsoft, Gameloft, THQ, Warner, CCP, Square Enix and UTV Ignition. These companies are typically console publishers looking for cheaper development which makes them responsive to fiscal measures (see financial support below). Other companies have been acquiring talented studios in new locations, such as Disney, Zynga, Tencent, Perfect World, Digital Chocolate, DeNa and Gree. These companies are typically online games companies looking to rapidly globalise their services.
- **Multiplayer, social and persistent games services:** Almost all games now have some form of connectivity whether to upload and compare high scores or to find and play with or against others in new genres such as massively multiplayer online games and social network games. Such games represent the transition of gaming from products to services and with it a radically different approach not only to publishing games but also development. Ensuring that the games remain appealing requires constant monitoring and continual development to keep the game content fresh. This process has been perfected by the top SNG developers who track almost every interaction a player has with their games and operate analysis teams to interpret the data and guide future development.
- **The rise of freemium and microtransactions:** Many of the early examples of games services were subscription-based and although subscriptions remain a key business model for many sub-sectors, microtransactions have begun to be incorporated into most major games categories. Microtransactions give players control over how much they spend on a game and, being open-ended, allow publisher to benefit from those willing and able to spend substantially more than they could with other models. This has often seen microtransaction companies generate not only rapid revenue growth but also much higher net profit margins than the most profitable console games publishers. Most microtransaction games are offered in games that are free to play, which has reshaped the MMOG and mobile games markets over the last 3 years, but has yet to impact consoles.
- **Games merchandising:** The exploitation of games brands outside of the games market is being conducted with increasing frequency. Hollywood has been a frequent licensee for games with large budget movies based on various games franchises such as Tomb Raider, Resident Evil and Prince of Persia although major box office success has been rare. Toys and other children's merchandise has also been very common with console games franchises such as Mario and Sonic

now joined by popular children's virtual world brands such as Club Penguin and Moshi Monsters. As gaming continues to grow in popularity and value, so too with games merchandising.

2.1.6 Games industry investment

The overwhelming majority of funding for console and handheld games production is sourced from publishers. Venture capital funding for these sorts of projects has become extremely rare although some publishers use project finance from third parties such as completion bond providers. Completion bonds are a form of debt instrument used frequently for movie financing and provided by specialist companies such as International Film Guarantor (part of Allianz). They allow publishers to substantially reduce the risk of production funding and take the cost off their balance sheets.

In contrast, the majority of network games ventures are self-funded with many companies aided by external investors such as angels and venture capital firms. Investment in privately held games companies worldwide in 2011 ($1.15bn to date) is likely to overtake the all-time high of 2007 ($1.26bn). The USA is the dominant recipient territory since 2000 (55% of funding value) and has been consolidating its position in recent years with over 83% of the total 2009-2011 funding value to date. Europe, in comparison, has commanded around 10-15% of funding during this period. Funding for North African and Middle Eastern games ventures has been almost non-existent in part due to the paucity of investment opportunities but primarily because there are so few investment companies with an interest in games in these territories (Twofour54 being a notable exception). This does not mean that investment has not gone into servicing the NA/ME region. Turkey-based Peak Games raised $5m from Germany-based Early Bird Venture Capital for social network games specifically for Turkey and NA/ME.

Investment in private games companies has increasingly been going into network games ventures and has been a major contributor to innovation in this space. Social network gaming companies have benefited in particular in recent years: 63% of 2011 funding to date funding has gone into social network gaming vs. 41% for the whole of 2010. Other major investment categories are mobile gaming, MMOG and casual online gaming and network games services (payment specialists, cloud gaming), each representing around 9% of 2011 funding to date. The current hot investor areas are hard-core social network gaming, mobile social network gaming, location-based entertainment and gamification.

Examples of investors are London Venture Partners (UK-based early-stage investment firm), Early Bird Venture Capital (a German early-stage investment firm), Index Ventures and Balderton Capital (European VCs targeting small and mid-sized companies and with a strong games industry investment history) and Summit Partners and TA Associates (US private equity companies looking at larger companies and seeking a majority position).

Chapter 2.2: Major games industry sub-sectors

The global games industry can be divided into many interlinked and overlapping component parts, which we have divided into six key sub-sectors into which all major segments of the market fit.

2.2.1 Console, handheld and PC boxed product

Headline description

High street and online retail of boxed games for console, handheld and PC is the standard distribution and business model for the games industry for most of its history and still dominates the global games market by value. With a few exceptions, the highest grossing games each year are boxed

console titles such as new releases in the Grand Theft Auto, Halo and Call of Duty series all of which can generate high hundreds of millions of dollars in revenue (and some over $1 billion) with a single title. Games such as these (known as AAA titles) typically cost tens of millions to develop and several times more to market whilst the physical retail model saps substantial margin from the value chain making cutting edge console games development a potentially very high risk games category in which a diminishing number of companies operate.

The transition to complete digital distribution of these games is inevitable in the long term but only the long-term. The data size of most console games and inadequate average bandwidth in the west precludes a complete move to network distribution of games products during the next five years at least. While digital distribution of a small proportion of these types of games is possible today, boxed product sold at retail will remain a key part of the industry for at least another decade and most likely longer.

Value chain and role descriptions for console/handheld games

The following companies perform roles in the value chain:

Independent studio: A privately-owned development company of varying size, offering a suite of services from concept creation through full production and some support functions. Most studios specialise by genre and games platform, building on their experience. Independents, particularly those in the casual games space, often have fewer financial resources and survive on a mixture of 3rd party work for hire and, less frequently, the creation of their own IP.

Publisher internal studio: A full service development studio owned by a publisher, usually fairly well financed and focused on producing complete games. Publisher studios typically specialise in particular genres and games platforms based on their experience. Publisher studios frequently derive from an acquisition, and they can be run with considerable cost inefficiency when tasked with delivering flagship IP.

Publisher: A company that typically finances and markets games and oversees the manufacturing and distribution process (often by a third party). As publishers are the primary source of finance for retail games production, they are the most important link in the console, handheld and PC boxed product value chain, a position they also have used to become the industry's largest IP owners.

Console manufacturer: Sony, Nintendo and Microsoft create console hardware and often sell it at a significant loss in order to build up as large an installed base as possible. This loss is subsequently clawed back by games software licence fees levied on all third party software publishers. They also operate internal development studios working exclusively on their own platforms.

Distributor: Distributors in this value chain provide conveyance services getting games physically from manufacturers to retailers. Many of the largest publishers own extensive distribution infrastructure, some providing distribution services to third party publishers with no distribution

network of their own. There are also plenty of third party distributors although distribution is a low margin, high churn business that has few consistent independent market leaders.

Manufacturer: Disc replication is conducted through the console manufacturers either actually by them or via licensed third party replicators. Other manufacturers include box and manual (and other game inserts such as advertising flyers) creators.

Retailer: Once comprising just small specialist games software shops, the games retail market is now dominated (by value) by large specialist games chains such as Game (in Europe) and GameStop (in the USA), online retailers such as Amazon as well as all of the leading supermarket chains. Games retailers have increasingly been turning to used game sales to supplement their new games software and hardware sales, much to the displeasure of games publishers.

Outsourced service provider: A provider of specialist services for games development such as art and animation, QA and localisation.

Key trends
The following are the most important trends in this sub-sector:

- **Market cyclicality:** The highly cyclical historic growth profile has been pronounced and somewhat predictable because either the consoles of the time waxed and waned at roughly the same time or the cycle was dominated by just a single platform. The unexpectedly rapid and extensive rise and then fall of the Wii market over the last 5 years has taken place while the PlayStation 3 and Xbox 360 have experienced more consistent and slower-building growth. With two handheld platform cycles declining (PSP and DS), a new one (3DS) launching and some major new extensions to the existing consoles (motion sensing gaming), the last few years has seen the retail games market fall overall.
- **Ever increasing risk:** As we have shown, each new generation of games console drives up development costs. However, such cost escalation has not tracked average retail price rises nor have publisher margins altered significantly over the years, leading to ever increasing publishing risk for all those in this market. At the top end of the market, AAA titles cost tens of millions of dollars to develop, have the highest quality expectations and have huge marketing budgets. The result has been an increased stratification of the retail games market with most retail games publishers only able to operate at the lower or mid tiers of the market and a diminishing number of companies able and willing to operate at the upper end. This economic pressure has resulted in numerous companies (Disney, Atari and MTV Networks) exiting or scaling back their retail games operations in recent years.
- **Second hand market**: Many specialist and even some non-specialist games retailers buy and then re-sell used console and handheld games, an old practice but increasingly important for some leading retailers. It has led to significant tension between retail and games publishers which have historically seen no revenues from such trade and, they argue, suffered from reduced new games sales. Retailers have remained unapologetic and maintain that the used games trade actually increases the purchase of new titles by giving gamers more spending money. Publishers have responded by providing new games purchasers with extra content and charging used game buyers to unlock certain games content and features.
- **PC games digital distribution via downloads**: The digital distribution of games products online is already having a profound impact on the PC games market because it comprises open standards (Windows and Mac primarily) which give publishers complete freedom to choose from dozens of digital distribution partners (e.g. Steam, the clear market leader). These have been growing rapidly, at the expense of retail-based boxed product sales but the overall figures are

still tiny compared to boxed console and handheld games sales.

- **PC games digital distribution via streaming:** An alternative to downloading and installing entire PC titles is games-on-demand. This comprises two types of streaming technology: application streaming which installs c. 25% of a game, runs the game on the client and loads the rest only as needed (as provided by Exent) and video streaming where the game is run remotely and the client simply provides a control interface and video feed (as provided by OnLive, Gaikai and G-cluster). Both technologies have been in commercial operation for around a decade and have consistently failed to reach mass-market penetration despite their great promise. There are several reasons for this. The most important is that they are confined to PC gaming only and, almost exclusively, to retail-based PC gaming, a market that has been in decline for the last decade with reducing value, development investment and release volume. Secondly, their appeal is inherently niche targeting a minority of PC gamers lacking the means of playing PC games or the desire to buy games but willing to pay rental charges for games. Finally, they are highly bandwidth and latency-dependent services. Although application streaming necessitates modest broadband speeds (c. 300KBPS), video streaming requires a minimum of c. 5MBPS which rules out a significant number of potential players. Latency, not an issue for application streaming, is critical for video streaming as it governs the speed with which a player's inputs are reflected on the screen. Modest latency (over c. 150MS) can mar the game experience while high latency (over c. 400MS) can render the game unplayable. We are very sceptical about streaming's commercial viability with PC games but believe it could have a more solid future with console gaming where titles are plentiful, the online services are mature and player volumes are high.
- **Console and handheld games digital distribution:** Games-on-demand undoubtedly faces a solid long-term future on console but none of the console manufacturers has yet indicated their intention to support it in the short-term. Digital distribution of console games is conducted by all three console manufacturers but is mostly restricted to the download of back catalogue releases and small-form games not available at retail. This situation is changing only slowly due to bandwidth restrictions, inadequate local storage and a reluctance to completely disintermediate the retailers. Hence, digital distribution on console and handheld represents a tiny proportion of the overall games software market at present and is unlikely to become a material proportion until the next generation of consoles launch (expected 2013-2015) although even these are not going to be digital distribution only platforms.

Brief profiles of 4 leading companies

Nintendo: Nintendo is a Japanese console manufacturer and games developer/publisher that has operated in the games market since the late 1970s. It pioneered the handheld games market (with its Game & Watch series) and its console and handheld platforms have at various times been market leading globally. Its current DS and Wii platforms led the handheld and console markets (by installed base) but it is equally known for, and successful with, its software. Nintendo-created games have always dominated software sales for Nintendo platforms, often to the frustration of third party publishers. Nintendo has been an unparalleled creator and publisher of global blockbuster games franchises from Donkey Kong, Mario and Tetris to Pokemon, Zelda and Wii Sports. Its hardware and software successes have resulted in Nintendo being one of the world's biggest games companies.

Sony: Sony's entry into the games market in 1995 revolutionised the industry (see the history section earlier in this report) and initiated a decade of global clear market dominance with PlayStation and then PlayStation 2. It has not fared as well since the middle of the 2000s. Its entry into the handheld market (in 2004) with the PSP failed to dislodge market leader Nintendo and the installed base of its PlayStation 3 console (2006) trails that of the Wii and Xbox 360. Despite this, Sony remains a key player in the industry. Like Nintendo it is both a console manufacturer and a games software

developer/publisher. Its games software business is not as successful as Nintendo's but this has benefited third party publishers who see Sony's platforms as more lucrative and accessible. Sony also operates an MMOG business, Sony Online Entertainment, which was the global market leader in the early 2000s but has not performed well recently. As a division of Sony Corp, Sony's games business has operated with a great deal of autonomy but has been heavily loss making for most of the last six years.

Electronic Arts: EA is one of the world's oldest independent (i.e. not a console manufacturer) games developers and publishers. For much of its history it has also been the world's largest independent games company and has consistently blazed trails, establishing commercial practices that would become industry standard such as studio-based development, direct distribution to retail, and perennial franchises. EA has innovated extensively in online gaming, popularising subscription MMOGs and casual online games communities aimed at older female players, and introducing premium subscriptions and microtransactions to casual online gamers. EA is comfortably the most diversified games publisher in the world with major operations in almost every category of gaming. However, it has been loss-making for many years as it continues to invest in these new network games markets and as it suffers from the retail market's decline.

Activision Blizzard: Activision Blizzard is currently the world's largest independent games company by revenue. It is actually older than EA and was the world's first independent games developer but for most of its history it remained in EA's shadow. It is majority owned by French conglomerate Vivendi which gained its stake after the merger of Activision with Vivendi Games in 2008. This deal delivered PC games specialist Blizzard, the global MMOG market leader and a division which alone generated around $1.7bn in extremely high margin revenue in 2010. Activision Blizzard has also established two genre-leading franchises over the last five years: Guitar Hero and Call of Duty. Whilst the former has suffered as the music genre has waned (see Games Content section elsewhere in this report), the latter has become one of the highest grossing games of all time generating over $1bn in sales with its last version alone. Despite its huge success in the MMOG market (albeit with a single title) and the retail games market, Activision is very much a laggard in most other corners of the games market in particular mobile, casual and social.

List of key genres

Action, adventure, sports, shooter, RPG, family, racing.

2.2.2 Mobile and tablet

Headline description

This category comprises games software and services sold for mobile phones including standard Java-based handsets, iPhones and other smartphones as well as tablets such as the iPad. The Java games market dates back to the 1990s and the early years of the consumer mobile telecoms industry. Japan emerged as the leading light in this market with mobile gaming prospering from innovations such as open platforms, operator billing, flat rate data schemes and efficient digital distribution systems, practices that the western market failed to adapt to until the late 2000s. In spite of systemic problems in reach, value chain congestion and quality, the western Java-based mobile games market did grow for many years but consistently failed to match the lofty expectations of industry. The arrival of Apple's iPhone App Store in 2008 and the subsequent disintermediation of network operators from the smartphone gaming value chain has not only accelerated the decline of Java gaming in the west but revolutionised and re-invigorated the western market.

Ironically, while many of the smartphone market's definition characteristics owe much to the Japanese market's innovations, the Japanese mobile games market has blossomed in recent years due to further innovations with Java gaming and smartphone adoption remains minimal. The net effect is a rapidly growing global market that is still dominated by Java gaming (which is itself still growing in Asia and other parts of the world but in decline in Europe and North America) but is being propelled by smartphone gaming which is steadily expanding outside of wealthy western territories and starting to make significant inroads into other territories, most importantly China, where it will likely form the primary games platform for a large proportion of users.

A more recent offshoot of the smartphone games market is tablet gaming. As with smartphone gaming, Apple has established a viable market with its iPad whilst a host of others have followed with platforms, most based on smartphone operating systems (e.g. Android and Blackberry) and offering very similar business models, app store distribution systems and user experiences.

Value chain and role descriptions

The following companies perform roles in the mobile games value chain:

Independent studio: The vast majority of smartphone and tablet games are developed by independent studios who self-fund and self-publish their titles. However, due to vast congestion on app stores, some have used publishers or distributors.
Publisher studio: Many of the largest mobile games publishers have internal development studios.
Tools and middleware: A range of development tools and middleware for license to studios, including multiplayer and basic community functionality, and games engines.
Publisher / Distributor: A company specialising in financing development (through traditional work for hire) via independent or proprietary studios, and/or promoting a portfolio of mobile games, and distributing them across multiple mobile operator or handset manufacturer portals.
Mobile Network / manufacturer: Apple creates the iPhone hardware, operates the iTunes and App Store shops and promotes a small handful of games titles via weekly editorial slots. Outside of iOS, mobile network operators, OS developers, and handset manufacturers maintain their own app store services catering for thousands of smartphone games on Android and other platforms.
Off-portal site: Third party websites and app stores that promote and handle payments for thousands of mobile games for direct download or side-loading to users' handsets.
Advertiser: Dedicated advertising sales network and agencies that sell inventory on behalf of studios and publishers.

Key trends
The following are the most important trends in this sub-sector:

- **Apple's disruptive influence:** Apple has radically altered the structure and direction of the western mobile games market with the introduction of the iPhone App Store in mid-2008. Compared to Java gaming, iPhone games necessitate little porting, offer better revenue share terms because operators are entirely cut out of the value chain and can be published by anyone. iPhone games delivered a higher quality user experience and end product. The result has been a massive increase in conversion rates and revenues vs. Java gaming and explosive market growth that has been bolstered by comparable services that have since been launched on all other smartphone platforms.
- **Massive oversupply and developer proliferation:** Apple's market revolution is not without its problems. All of the app stores (especially Apple's) quickly became highly saturated and competitive pressure drove down average prices close to their minimum ($0.99), the best games are increasingly difficult to discover and games' effective shelf lives can be brutally short. The opportunity to disintermediate network operators has stimulated an unprecedented proliferation of mobile games developers in the West. Although many of them are one-man bands, iPhone gaming has also attracted a huge number of start-up ventures, some of which have raised significant sums of capital.
- **Java gaming is a tale of two regions:** Java gaming in the west has suffered from endemic problems such as porting code to thousands of handsets, poor discoverability of games, high operator revenue share terms, mobile data costs, poor audience profiling, and poor quality of the average Java game product. The western Java games market is in terminal decline as a result but will remain a material part of the Western market for several years yet as the penetration of smartphones is still below 40% in even the most advanced countries[11]. In stark contrast, the Japanese mobile games market remains almost exclusively based on feature phones and Java titles but has been growing very strongly in recent years due to a boom in mobile social networking.
- **Mobile social network games:** The successful marriage of mobile gaming and social networks in Japan has established another precedent for the western market which is now starting to be followed. Like Facebook games, mobile social network games (MSNGs) build upon and encourage the use of players' friend networks. In Japan a small number of major social networks exist, all of them predominantly mobile–based, but in the West where Facebook is the dominant social network but offers no mobile games functionality, the MSNG market is evolving along different lines with a large number of disparate mobile social networks gaining traction (e.g. OpenFeint and Scoreloop). The fragmentation of this market will increase as more new market entrants try to establish market dominance. This will limit the growth of the MSNG market in the west but not prevent it from becoming an important and sizeable part of mobile gaming's future.
- **Android's long-term market dominance potential**: Very much a follower of Apple's lead, Google's Android smartphone platform is shipping fast enough to become the most important in mobile gaming in the long term. Android is still beset by some debilitating problems (such as the comparatively limited billing localisation and international territory support for the Android store) but there is a steady flow of improvements and a commitment from Google to grow the platform.
- **Tablet gaming's potential is huge**: The success of Apple's iPad tablet has, like the iPhone, inspired a wave of copycat products, most based on existing smartphone operating systems. Games have dominated the app stores as they do on smartphone and tablets' larger screen size introduces the potential for local multiplayer gaming such as electronic versions of family board games. In contrast to portable gaming platforms which are based on static standards which are only replaced every 5+ years, the processing power of tablets is increasing at a constant pace. As

[11] eMarketer, 2010

a result, tablets will become increasingly competitive with and disruptive to portable gaming platforms even if there will continue to exist major games production value differences.

Brief profiles of 4 leading companies

Electronic Arts Mobile: In keeping with its pioneering spirit (see the main EA profile in the previous section), EA was one of the earliest companies to invest significantly in the mobile games market by making mobile adaptations of some of its more popular games brands. It quickly became a leading mobile games publisher and consolidated its position with the $680m acquisition of rival mobile games publishing specialist Jamdat in 2005. Since then, it has remained the largest mobile games publisher in the west with annual revenues of over $240m. It is still very much focused on the western market but has enjoyed solid success on iOS having acquired Angry Birds publisher Chillingo and Flight Control developer Firemint in the last year.

DeNA: DeNA is a Japanese mobile social network focused on gaming. Its network, Mobage Town, is still mostly Japanese but generated around $1.4bn in revenue in 2010. Its ARPUs are huge and derive from the sale of games-related virtual goods and services all of which are strongly tied into its social networking functionality. DeNA has begun to expand out of Japan in the last year with localisation deals in Korea and China and the acquisition of US iPhone games publisher ngmoco in a deal worth up to $403m. ngmoco was developing its own mobile social network (Plus+) which it continues to operate whilst also handling the US roll-out of Mobage.

Gameloft: The second biggest mobile games publisher in the west is French-owned Gameloft with 2010 revenues of just over $200m. Gameloft was founded by members of the founding family of Ubisoft (a major retail games publisher) as a dedicated mobile games publisher. Like EA Mobile, Gameloft has diversified interests in all mobile games platforms but is more internationally focused than EA Mobile. It continues to invest heavily in Java gaming which in its most recent financial statements it revealed was a strategy which is winning it increasing market share and revenue growth due to the strategic withdrawal of competitors.

Rovio Mobile: Finnish mobile games developer Rovio Mobile is notable for its blockbuster mobile games hit Angry Birds. The company was founded in 2003 and famously released 47 games that met with limited success before striking gold with Angry Birds (which was actually published by a third party, Chillingo). Since then, Angry Birds has consistently topped the iPhone games sales charts, generated tens of millions of dollars in revenue and allowed Rovio Mobile to raise $42m in VC funding. Although by no means the largest player in the mobile games market, its inclusion in this list is because it amply demonstrates the benefits of an open and meritocratic games platform that a 6-man team can generate such commercial success with such limited resources.

List of key genres

Action, puzzle, strategy, card, word and board games and quizzes, adventure, sports

2.2.3 Casual online games

Headline description

The term 'casual' is now applied in most games sub-sectors to denote a particular style of game and/or demographic target market. For the purposes of this report, we define casual online games as the commercial exploitation online of simple, short-duration PC games aimed at mass-market (rather than core gamer) demographics via casual games portals and download services. This multifaceted sub-sector is driven by games companies providing casual games and games services to mass-market demographics, principally older female players and children. It comprises downloadable games

typically sold on a try-before-you-buy basis or accessed via subscription and browser-based games (mainly Flash-based but also Java and, increasingly, HTML 5) monetised by advertising, subscription and microtransactions. The origins of this sub-sector date back to the 1990s and the provision of simple time-killing puzzle and card games accessible via the web. These games' popularity led to their aggregation on search engine portals and games services that deliberately cater to non-core gamer demographics such as Pogo, Big Fish Games and Worldwinner. Today casual online gaming is a multi-billion dollar corner of the industry but one which sits in very close proximity to many other games sub-sectors and has seen its growth curtailed by the rise of new sub-sectors such as mobile and tablet, and social network games.

Value chain and role descriptions
Below are two value chains for 2 key forms of casual online gaming:

Casual game downloads

Ad-supported casual browser games

The following companies perform roles in the value chains (NB some companies span multiple or all stages of the value chain):

Independent studio: A privately-owned development company of varying size (but more often than not under 5 staff) which develops casual browser and download games. Such companies are usually reliant on third parties (distributors / aggregators and portals) for the vast majority of their business.
Rights Holder: Creators or owners of format rights such as film studios, television producers and broadcasters, media licensors, print publishing companies and (rarely) games publishers that license well-known IP that already has a market in other media.
Portals: A company specialising in creating and maintaining one or more high traffic, destination web sites to act as platforms for aggregating, distributing and selling directly to consumer a wide range of games.
Portal studio: Many of the largest portals began as development studios and capitalised on the success of their own games to create portals featuring third party content. Many others have built up

their own internal development resources to supplement the content licensed or acquired from third parties.

Distributor / Aggregator: A company that specialise in distributing your game across a network of sites with high levels of traffic, manage branded 3rd party sites or own high traffic sites that promote third party content.

Online advertising sales house: These split between generic online advertising sales companies and advertising companies specifically targeting in-game advertising within games or specialist games portal advertising companies, both of whom sell direct to media buyers offering inventory across networks of sites or games.

Online fulfilment provider: Companies that provide the transactional back-end for sites that charge consumers directly for games or games services. Such companies identify and authenticate payers, validate their payment methods and process direct payments or deposits into electronic wallets.

Key trends

The following are the most important trends in this sub-sector:

- **The importance of community features:** Over the last few years, many of the major download and browser based games portals have focused on expanding their services beyond games aggregation towards community building. Features such as universal points systems, high score leaderboards, achievements and customisable avatars help engender loyalty, increase engagement and can be used to incentivise user-get-user recruitment. They have been successfully employed on portals targeting all demographics working just as effectively for 25-55 year old women (for example iWin) as for teen and pre-teen children (for example, AddictingGames).
- **Impact of social network gaming:** Social network gaming borrows community and business model features from more advanced casual games services such as Pogo but it shares an almost identical core demographic of older female players and the meteoric rise of social network gaming has been in part at the expense of parts of the casual online games market. Some of the largest older female oriented portals (such as Games.com) have seen traffic stagnate or decrease over the last 2 years, some significantly so (such as Yahoo Games). Due to a combination of age restrictions for Facebook registration and social network games content being largely focused on older players, the teen and pre-teen oriented online games portals have been less affected by social network gaming but it has still undoubtedly curtailed their growth to a degree. This impact is more likely to increase rather than decrease.

- **Business model diversification:** The standard business models for casual online gaming has been advertising (for browser gaming) and network retail (for downloads) for the last decade. In the last two years the adoption of alternative business models, such as subscriptions and microtransactions, has been gathering pace and yielding commercial success.

- **Download price war:** Following over seven years of tacit and universal adherence to a $20 standard price point by all the major casual PC download portals, a major price war took place in 2009 which had substantial implications for the market. A drop to $7 for standard games pricing has now been accompanied by the introduction of several tiers of higher price points for higher quality games. Although the price war increased purchase volumes, it did not compensate for the decrease in revenue per title for most companies and many portals (and resellers) have been forced out of the market, most notably Amazon's Reflexive division which, ironically, was one of the instigators of the price war in the first place.

Brief profiles of 4 leading companies

EA Pogo: EA acquired casual games portal Pogo in 2001 for around $40m and has used it to spearhead much of its innovation in casual online games. Pogo was the first to focus heavily on community features and epitomises best practice for portals targeting an older female demographic. It was the first to offer a premium, subscription-based casual online gaming service (Club Pogo) which, thanks largely to its strong community features, was a huge success gaining, at its peak, nearly 1.8m paying subscribers. It was also the first to employ with this demographic a comprehensive avatar system and integrate microtransaction-based payment for premium avatar items, both of which proved to be a success. EA went some way to establishing several precedents for monetising this demographic, precedents that would be copied and improved with social network games. Pogo has suffered due to social network gaming in the last 12 months with reduced monthly traffic but Club Pogo still generates over $100m in revenue per annum.

Big Fish Games: Big Fish Games began as a developer of downloadable casual games targeting older female players. Its Mystery Case Files series popularised the hidden object genre (a category of puzzle game in which players must find specific items within cluttered scenes), precipitating a deluge of similar games which still dominate the download market to this day. Mystery Case Files' success gave the company the momentum to establish itself as the leading casual download portal whose business practices most others have followed. The company claims not to have been negatively impacted by the rise of social network gaming but has diversified into smartphone and tablet gaming recently with solid results. Big Fish Games generated well over $100m in revenue in 2010.

Miniclip: UK-based Miniclip is one of the largest browser games portals in the west with over 65m players per month. It began life in 2001 as a bedroom Flash games developer and evolved as its early titles gained viral success, in particular amongst children. Its portal, comprising over 650 titles, remains focused on younger users and it monetises them almost exclusively via advertising. A key strand to this advertising strategy has been striking referral deals for children's MMOGs such as RuneScape and Club Penguin where Miniclip gains a proportion of all revenues generated by the players it refers to their services. Such is the level of traffic generated by Miniclip and passed on to these partner companies, Miniclip has found itself in a powerful position to dictate terms to MMOG companies seeking to tap Miniclip's rich veins. In the last 12 months, Miniclip has enjoyed success expanding into iPhone games development both generating download sales and promoting its web portal.

Spil Games: Holland-based Spil Games is a relative newcomer to the casual online games market having been founded in 2004 but has grown to become one of the largest casual online games networks in the world with over 115m monthly visitors. Rather than create a single destination site like Miniclip, Spil created a flexible content management system and a huge portfolio of categorised browser games which it markets and distributes through a network of over 40 sites differentiated by nationality, demographic and content type. It caters to 19 different languages with over 1,300 games and typically segments its portfolio by demographic groupings of tween girls, teens and family players. It also has an open publishing system allowing third party sites and portals to embed any and all of its games on their own site.

List of key genres

Puzzle, card, word and board games and quizzes, action, music, shooter

2.2.4 Massively multiplayer online games and virtual worlds

Headline description

We define MMOGs as online games that support hundreds or more concurrent players in a constantly available, shared virtual game world. We deliberately differentiate MMOGs (standalone games) from social network games (played on social networks) even though many SNGs share the same characteristics as MMOGs. MMOG games services are refreshed continuously by companies who usually monetise their own customers directly via subscription, microtransactions and, to a much lesser degree, advertising. Whilst the majority of such games are role-playing games (MMORPGs), strategy games, sports games and virtual worlds (where gameplay is of secondary importance to socialisation, communication, community and creativity) are all popular. The core MMOG audience is 15-35 year old males although the majority of virtual worlds target young children (6-12) and there is also a vibrant market for MMOGs (such as RuneScape and Dofus) primarily aimed at tweens to mid-teens. MMOGs may have been pioneered in the west but the Asian MMOG market is now several times larger and growing at a faster rate.

High-end MMOGs are the most expensive and highest risk form of games development often necessitating 4+ years of development by a large team with more diverse skills than is found in other forms of games development. Development budgets in the high tens of millions of dollars for such games are not uncommon and one or two will have exceeded $100m before launch. However the potential returns from this market are also substantial with many Asian companies generating 50%+ profit margins from rapidly growing nine figure revenue levels. These high-end games are all download titles (typically free but sometimes retailed or network retailed) and contrast with browser MMOGs, typically developed in Flash, which rarely cost more than $1m to launch but can attract larger freemium user bases. Due to the openness of the platform and size of addressable market, almost all MMOGs are PC based although there are a tiny number of console MMOGs launched and in development.

Value chain and role descriptions

The following companies perform roles in the value chain:

Independent studio: Privately-owned games developer that creates games for self-publishing or for third party publishers. Work-for-hire MMOG development does exist but is rare. Most independent MMOG studios work on their own MMOG IP.

Publisher studio: Although there are numerous dedicated MMOG publishing firms with no internal development, the majority of MMOG publishers have internal development teams.

Rights Holder: Creators or owners of format rights such as film studios, television producers and broadcasters, media licensors, print publishing companies and (rarely) games publishers that license IP to games companies in this sector.

Portal/Publisher: A company specialising in financing development, and promoting and maintaining destination web sites for consumers to access its portfolio of games. Many have their own internal studios.
Distributor / Aggregator: Either a company that specialises in distributing games content across a network of sites or owners of high traffic sites that promote content from other sites. [12]
Online fulfilment provider: Companies that provide the transactional back-end for sites that charge consumers directly for games or games services. Such companies identify and authenticate payers, validate their payment methods and process direct payments or deposits into electronic wallets.

Key trends
The following are the most important trends in this sub-sector:

- **Asia dominates the global market:** The Asian MMOG market represents around three quarters of the global MMOG market by value and houses most of its largest companies. MMOGs have found a natural home in Asia as most countries have little or no competing indigenous console or handheld markets to speak of, have high PC usage (in computer cafes and at home) and good network connectivity. With extremely high piracy rates for boxed PC games, developers have sought to provide forms of gaming that are accessible to the mass gamer market whilst being piracy proof. MMOGs fit this bill perfectly and have exploded in popularity over the last decade. Korea led the early charge but China over the last three years has overtaken it to become not only the biggest MMOG market in the world but also one that still has huge growth potential. China operates protectionist policies severely limiting the potential of overseas companies to operate in their country.
- **The rise of browser gaming:** MMOGs developed in Flash and Java have proliferated in the last five years, in part due to the enormous success of German MMOG specialists such as Bigpoint and Gameforge who have proven that the increased accessibility of native browser technology more than compensates for its technical limitations and can attract tens if not hundreds of millions of players. Coupled with freemium and microtransaction models and extensive localisation into territories where high-end PCs in the home are uncommon, browser gaming has grown to become a major part of the MMOG market by value and an even greater part by release volume due to their relatively small average development costs.
- **The rise of microtransactions in the west**: Microtransaction MMOGs were a rarity in the western market four years ago but have proliferated rapidly since then. 65% of all MMOGs launched and operational in the west today derive some or all of their revenue from microtransactions[13]. Their ascent is inextricably linked to the growth of browser MMOGs, virtual worlds and, in particular, Asian MMOGs but their use has been spreading to high-end download games too. Microtransactions are still more widely used (and popular) in Europe than North America. However, as microtransactions have become increasingly 'proven' in North America, microtransactions will eventually become the standard for all high-end western MMOGs even if they are operated in conjunction with subscriptions.

[12] Since MMOGs require constant connections to the game servers to authenticate players, track and record their progress and reflect relevant player actions to all players in their virtual vicinity, the role of network distribution is critical. Since per-player bandwidth requirements are minimal (typically under 100KBPS), bandwidth is important in aggregate only and needs to meet peak concurrency requirements that rarely last more than a few hours per day. Latency is more important, mainly to reflect other player actions with the minimum of delay (high latency can render an MMOG unplayable). Network distribution choices are broadly based on self-hosting (suitable for smaller regional MMOG publishers only although some of the largest MMOG publishers have built their own massive server farms in key parts of the world) and co-location. The latter involves running servers on third party networks such as TeliaSonera which are sufficiently widely distributed geographically to ensure low latency for all players and large enough to cater for potentially bursty MMOG bandwidth requirements.

[13] GIC, 2011

- **The rise of freemium**: Although freemium MMOGs (where some parts of a game are only accessed via payment but the rest is permanently free) have existed since the late 1990s, they have experienced a major surge in adoption in the last four years. The vast majority of the c. 400 titles launched in the last three years have been freemium which has resulted in 86% of all MMOGs launched and still operational in the west today being freemium[14]. Freemium can be applied to all MMOG types from subscription and microtransaction games to browser and client download titles but it radically alters an MMOG's business model. Whilst dramatically increasing the accessibility of a game and, as a result, its player base, freemium also requires the paying minority to cover the costs of the free majority. It is a potentially tricky financial balancing act but one that the leading companies have been able to generate substantial revenue and margins from. Freemium is rapidly becoming a competitive necessity although some forthcoming hard-core MMOGs will continue to use mandatory subscription or microtransaction models.

Brief profiles of 4 leading companies

Blizzard: A subsidiary of Activision, Blizzard is a specialist PC games developer that developed the most successful MMOG of all time, World of Warcraft (WoW), a fantasy MMORPG. WoW was launched in 2004 and quickly smashed through historic MMOG sales records defying industry logic and even internal expectations. It became the first game to generate over $1bn in a single year (2008) for its publisher and has continued to do so at very high margin since then (generating $1.4bn in 2010, $1.2bn from WoW). Until recently, it was the single biggest MMOG company in the world employing well over 2,500 people, the overwhelming majority of whom work on WoW. WoW's success can be attributed on the company identifying and improving the most successful features of existing MMOGs, eradicating all of the worst features and producing not just an extremely polished game but an extremely polished service that appealed to light as well as heavy MMOG players. WoW's business model is subscription based in the west and microtransaction-based in Asia but it also sells incremental content and services in the west which has allowed it to increase revenues per user even as its overall paying user base has stagnated over the last 2 years. Blizzard has announced that it is to make WoW freemium, offering the first 20 levels for free and is developing a new MMOG due in 2013, both of which will undoubtedly propel revenues.

Tencent: Tencent is a major Chinese telecoms and media company whose games division is the Chinese MMOG and, more broadly, online games market leader. With its most recent quarterly network games revenues exceeding $550m, Tencent is now the world's largest network games company overall. Tencent's online games operations are very skewed towards MMOGs but also includes casual online gaming on portals, mobile, social and instant message networks. It operates an array of internally developed, and externally commissioned and licensed MMOGs all of which are freemium and supported primarily by microtransactions. Its peak concurrent games usage is 7.7m and targets a predominantly young male user base but also females and children. Surprisingly, Tencent has achieved all this with an almost exclusive focus on China. However it has begun an international expansion of sorts, paying a reported $400m to acquire US MMOG developer Riot Games in early 2011.

Nexon: Nexon is the Korean MMOG market leader with 2010 revenues of over $870m. It is also one of the oldest MMOG companies in the world having begun life in 1994. Nexon was not only one of the first MMOG developers but also one of the first to use microtransactions and freemium. Like most major Asian MMOG companies, its success has been built on the back of a large and ever growing portfolio of titles although 2004 and 2005 proven critical years for the company with the release of

[14] GIC, 2011

several MMOGs (MapleStory, Mabinogi and Kartrider) that were to become major domestic and international hits. Kartrider, a cartoon kart racing MMOG featuring highly customisable karts and characters, was the most significant of these attracting over 230 million players worldwide. Nexon has been steadily expanding overseas with extensive licensing revenue from China and Japan and a US office which handles its North American MMOG launches. Nexon recently moved its headquarters to Japan in preparation for a flotation on the Tokyo Stock Exchange.

Sony Online Entertainment: SOE is a division of Sony Computer Entertainment and the one-time MMOG market leader. SOE has existed since the mid 90s but only released its first MMOG, Everquest, a fantasy MMORPG in 1999. Everquest, like WoW after it, smashed both sales records and industry preconceptions to gather some 450,000 paying subscribers at its peak. Everquest fared strongly for many years but suffered as direct competitor WoW's popularity grew. SOE followed Everquest up with a number of titles, including one based on the Star Wars universe, but none that got close to Everquest. Despite this, SOE remains one of the biggest MMOG publishers in the west and is included in this list because it is also one of the only ones to launch and make a commercial success of a console MMOG (DC Universe for PS3).

List of key genres
RPG, strategy, shooter, racing, card

2.2.5 Social network games

Headline description

We define social network games as games that are designed specifically to operate on web-based social network platforms such as Facebook, MySpace and Orkut. While they share much in common with MMOGs, casual online games and even mobile games (in Japan), social network games are differentiated not only by being tied technologically to specific social network platforms but also by featuring gameplay designed to take advantage of social network users' social graphs (i.e. communication within their friend networks). Social network gaming is the newest of the sub-sectors having been precipitated by the opening up of the lead social network Facebook to third party developers in 2007. Since then the market has accelerated at remarkable rate and allowed the creation of one of the fastest ever growing games companies, Zynga.

On Facebook, the main gamer demographic is older female players despite the fact that younger demographics represent a larger proportion of Facebook users overall. This mismatch is for several reasons. Firstly, younger players are more discerning gamers who are well served elsewhere and there has been a self-perpetuating cycle of content development for and viral recruitment of older female players (who were the first demographic to start playing Facebook games en masse). This is changing with an increasing number of developers refocusing or diversifying into games for different demographics. The social network games market is thriving outside of Facebook and the west; there are scores of other networks that support games, some of which are of substantial size (e.g. Renren, Vkontakte etc).

Value chain and role descriptions

The following companies perform roles in the value chain:

Independent studio: Full service development studios, that produce, distribute, promote and maintain complete games services some with portfolios of multiple titles that are based on Facebook's and other social networks' APIs.
Social network: Company that maintains a social network service for consumers and offers interfaces into its underlying platform to allow developers to create games that use features of the social network.
Publisher/distributor: Aggregators of games from 3rd parties, some are developer/publishers that either actively seek or passively receive requests to cross-promote promising 3rd party games using traffic generated by 1st party games. Others are simpler affiliate networks with no development capability that exchange and sell traffic between members of the network.
Payment/fulfilment solution: Companies that provide the transactional back-end for services that charge consumers directly. Many social networks also undertake this role, in some cases, to the exclusion of all other payment solution companies.
Offers company: A company that provides a hybrid advertising and payment service allowing users access to virtual services and currency in return for signing up to advertising offers.

Key trends

The following are the most important trends in this sub-sector:

- **Facebook leads international growth in social networks:** Social networks are one of the fastest growing categories of website. In Europe its reach was second only to search in 2010[15]. However, penetration is still not at saturation point, which means that social networks, particularly in less mature markets such as South America and Asia, will continue to grow healthily. Facebook remains the clear global market leader and has been consolidating its lead, growing faster than most other networks and steadily squeezing out local competitors such as MySpace (NA), StudiVZ (Germany) and Tuenti (Spain). Whilst North America and most of Europe are dominated by Facebook, other territories have viable alternative platforms such as Orkut (Brazil) and Renren (China) and both Google (which owns Orkut) and Microsoft are expected to make increasing inroads into the social network market with their own platforms.
- **Zynga's Facebook games market dominance:** Zynga is easily the largest Facebook games company which attracts 42% of all daily active users of games, nearly ten times larger than its nearest rival, Electronic Arts (4.4%)[16]. With revenues of $235m in its most recent quarter, it represents an even greater share of the market by value thanks to its sophisticated commercial and marketing strategies. Interestingly, Zynga's market share (by DAU) had fallen steadily during

[15] comScore: The 2010 Europe Digital Year in Review
[16] Appdata, 2011

2011 (from over 47% in January) but has grown again following the launch of its most recent game, Empires and Allies[17].

- **Flash remains the dominant technology:** Flash is used by the vast majority of Facebook games developers although some make use of Java and HTML5 and an even smaller number use downloadable clients and plug-ins such as Unity. As with all categories of online gaming targeting mass market and more casual user bases, the use of non-standard plug-ins and downloads represents a major barrier to adoption and has rarely resulted in significant user bases or viable games. HTML 5 offers strong potential as an alternative social network games technology but is probably some years away from mass adoption. Flash 11 and its Molehill native 3D support also has a highly promising future, in particular for hard-core Facebook games developers, but is currently behind schedule.
- **Older female gamers dominate today but future growth will come from younger demographics:** Older female gamers are the main demographic playing on social networks today. They were first schooled on Solitaire on their PCs, moved onto online Flash games, then downloadable games and games communities like Pogo, before being recruited by their friends to play and then pay on Facebook. However, younger players from the traditional gaming, MMOG and casual online gaming camps are on social networks but are currently under-served by products targeting their tastes. This is steadily changing as more hard-core and youth-oriented titles are being launched and we expect that teen and 20-something players will become a distinct but increasingly important demographic for all major SNG companies.
- **Social networks on other platforms**: Facebook Connect / Open Graph and other social network's multi-platform initiatives allow non-Facebook applications with some access to their social graphs. Most simply allow registration and login via Facebook accounts and few operate genuinely shared services both on and off Facebook. Facebook gaming on mobile is currently limited to phones capable of supporting Flash with sufficient memory and processing power to run Facebook games, which is driving major investment in HTML5 by Facebook, Microsoft and others. New platforms could increase reach for SNGs but will present commercial issues around revenue sharing.
- **Facebook's commercial strategy**: Facebook games developers are inextricably yoked to Facebook's commercial decisions, which can be imposed suddenly and with little warning. Facebook's terms and conditions are constantly changing and the platform regularly undergoes redesign by the company, which can be equally driven by commercial priorities, data protection and privacy, and vociferous user feedback. Past redesigns and policy changes have hugely damaged third party application developers' traffic, revenues and profitability such as the decision to cancel notifications and make Facebook credits' (which have a 30% fee) use mandatory. Both advertising and applications can be summarily taken down by Facebook without warning.
- **Minimal western SNG localisation to date:** Despite relatively simple games and the fact that the majority of social network users are in countries where English is not the native language, there has been surprisingly little localisation by the leading SNG companies (most of which are American). Geographic diversification is only starting to feature in market leader's strategies and is being led by companies outside of the USA.
- **Significant funding going into future social games ventures:** The SNG market has proven highly attractive to venture capital investors in the last two years. 40% of all monies raised by privately held games companies worldwide in 2010 went to social network games ventures. During the first half of 2011, this proportion increased to 66% and is fuelling not only product proliferation and innovation but also considerable M&A activity in the sub-sector[18].

[17] Appdata, 2011
[18] GIC, 2011

Brief profiles of 4 leading companies

Zynga: USA-based Zynga's growth has been phenomenal since it was founded in early 2007. It has launched around 60 games since then and currently actively supports around 20 titles. Collectively its Facebook games attract over 57 million active users per day and 148m unique users per month. It is the clear Facebook games market leader by a factor of 10 and it hold the top 5 games slots (by DAU)[19]. It employs around 2300 staff which it has gained organically and via a remarkable 17 acquisitions in less than 24 months. Zynga, which is intending to float later in 2011, generated $597m in revenues in 2010 up from just $121m in 2009 and $19m in 2008. Its success can be attributed to multiple factors, most importantly its highly aggressive commercialisation and use of metrics collation and analysis to maximise its user growth and monetisation rates. In addition, it has used its scale intelligently by cross-promoting heavily and incentivising loyalty. Its commercial strategy has been widely followed by other SNG developers and many of its practices are now standard for the industry. However, Zynga has rarely innovated with gameplay, often taking an existing games genre (such as farming) and simply popularising it. Zynga has begun to diversify its business in the last 12 months, making significant investments and acquisitions in smartphone gaming.

EA Playfish: EA already had a small but growing social network business before it acquired the no. 2 Facebook games developer, UK-based Playfish in late 2009 for $300m (plus $100m in potential earnout). Playfish had specialised in family and older female oriented puzzle and quiz titles and had a reported 60m monthly active users at the time of the acquisition. Since then, EA Playfish's aggregate MAU has almost halved to 32m and its market share has fallen sharply although its revenues have increased and continue to do so[20]. Key to this has been the exploitation of some of EA's marquee brands (such as Monopoly and Scrabble for which it has long-term licenses from Hasbro) and a diversification of its target demographic towards the male demographic that enjoys its sports games. This diversification has, according to EA, resulted in much improved monetisation rates. EA does not break out its social network games revenues but they are believed to be well under $100m/annum.

Disney Playdom: Disney acquired US social network games publisher Playdom in mid 2010 in a deal worth up to $763m. Playdom was, like Zynga, a consolidator, using regular fund raisings and the acquisition of 8 different companies in the previous 12 months or so to maintain its growth. Its purchase by Disney was unusual since Disney's demographic heartland is young children, a demographic that is unable, legally, to use social networks in many territories, most notably the USA. However, Playdom is one of the few SNG developers to have grown its Facebook user base this year and since it was acquired, largely thanks to a single major hit, Gardens of Time. Playdom has around 500 employees and is the fourth biggest Facebook games developer by DAU[21].

Kabam: USA-based Kabam is unusual amongst major SNG developers in being exclusively focused on hard-core gamers, primarily young males. It is only the 17th biggest SNG developer by DAU [22] but is likely to be one of its most revenue generative due to the extremely high monetisation rates it has achieved with its hard-core SNGs. Kabam's origins are as an online sports community service but it decided to abandon this and focus on strategy games in 2009. Since then, the company has grown from 25 staff to over 450 and it has raised over $130m in venture capital to support this. Kabam's success has prompted a wave of investment and diversification into the same hard-core social network gamer space.

List of key genres

Strategy (particularly god sims), casino, puzzle, card, word and board games and quizzes, RPGs.

[19] Appdata, 2011
[20] Appdata, 2011
[21] Appdata, 2011
[22] Appdata, 2011

2.2.6 Services

Headline description

The games services market comprises a broad array of companies providing support to every category of games business. For development, these services include specialist outsourced development services (such as art and animation), tools and middleware provision, localisation and testing. For publishers, these services include financing, PR and marketing, physical and network distribution, billing and customer support. The games services sub-sector is too disparate to measure as a whole and few research businesses have even attempted to measure even its major constituent parts. In part this is because of the array of B2B business models employed that range from straight licensing and fixed fees to revenue share agreements. What is clear though is that the continued diversification of the games industry as a whole, geographically, demographically, by platform, business model and distribution method combined with the increasing complexity of high-end games development and deployment is leading to increased opportunities for service company intermediation and specialisation.

Value chain and role descriptions

Service companies do not have a value chain per se as other sub-sectors do as their constituent companies are all intermediaries at widely differing points in other value chains and few have a focus that extends beyond more than one part of these value chains. Tools and middleware companies, for example, are usually employed at the development stage only whilst payment and fulfilment solutions companies have their own dedicated stage which few companies outside of payment and fulfilment undertake themselves. As such, we have not presented a value chain or role description for the services sub-sector.

Key trends

The following are the most important trends in this sub-sector:

- **Growing platform complexity**: As stated earlier, the advent of new console and handheld platforms increases the sophistication and complexity of games development for them, necessitating development improvements assisted by tools and middleware companies. Developers have been increasingly forced to maximise development efficiency and minimise unnecessary new technology development. This has benefited the tools and middleware market although services focused on high-end development have suffered from the falling number of publishers (and titles) competing in that end of the market. In fact, tools and middleware service providers targeting lower down the cost/complexity scale have begun to benefit from competitive pressure making time-to-market increasingly important. For example, in the mobile market, companies such as Unity have been growing extremely rapidly as mobile developers have proliferated and sought to get their games out as early and widely as possible.
- **The need for more and better content**: As platforms grow in complexity, they require ever more games content such as locations, items, characters, dialogue and narrative. Typical single-player games may be getting shorter but they demand more realistic graphics, more detailed back drops and more interactive assets. Multiplayer and persistent world games all require not just a large amount of content before launch but also a steady flow of new content to keep players interested. There are technology solutions for this but more often than not the solution lies in manpower. This has driven a significant and growing market for outsourced art and animation services in particular, many of the largest of which are located in low cost territories in Asia, India and South East Asia.

- **Platform proliferation**: The proliferation of platforms is likewise causing development cost and complexity problems for cross-platform publishers which need is triggering technology development such as Ideaworks Labs' solutions and HTML5. Platform proliferation looks set to continue and grow more complicated as new distribution systems, operating system variations and hardware configurations are rolled out.
- **The move from products to services**: The games industry's steady transition from product to service providers has opened up a range of new games service categories. Since services need to be maintained and supported 24/7 and are, more often than not, reliant on ongoing rather than up-front revenue streams (subscriptions, microtransactions and advertising), trying to do everything in-house is impractical and higher risk. This is driving serving into the cloud, outsourcing support services and third party aggregation of billing solutions.
- **Geographic diversification**: The suitability of many forms of network gaming for international exploitation is fuelling a growing need for both development localisation as well as localised customer support, on top of the mature localisation services market primarily focused on translation..

Brief profiles of 4 leading companies

Epic Games: USA-based Epic Games is a high-end hard-core games developer, mobile and small-form console games publisher and one of the biggest middleware providers in the world. Epic's technology began life as a by-product of its games development division but its Unreal Engine middleware solutions has become the market leader in graphics middleware powering a number of the most successful console games for current generation consoles. Due to the high-end nature of the technology and the commercial potential of the games Unreal Engine can be used in, Epic has been able to levy above average licensing fees and even material revenue share. More recently, Epic has begun to cater to smaller form games developers (for XBLA or PSN) as well as iPhone games developers, reducing its fees accordingly.

Virtuos: Shanghai-based Virtuos is a full service development outsourcer founded by former staff of Ubisoft, a large French publisher that was one of the first to open a Chinese office. The company now has 600 staff in 2 locations and primarily provides art and animation services to the games and movie industry but also has worked on QA, audio and even full games development projects. It has largely worked on western games including many major and big budget releases by large western games publishers. The Chinese outsourcing market has boomed in recent years but in doing so has resulted in major increases in competition between companies, rapid staff turnover and substantially above average wage inflation for the better quality and more experienced staff. As a result, China's cost advantage has been steadily diminishing to the point where it is no longer a major factor in many publishers' decisions to choose Chinese outsourcing companies.

Babel Media: UK-headquartered Babel Media is one of the largest games service companies and provides an extremely wide range of outsourced development and publishing services for all forms of games developers. Key services are QA testing and localisation. The company has tested over 1,500 titles to date and worked with all of the largest games companies in the west and many in Asia. It employs 250 full-time and 350 part-time staff at facilities in the UK, India and Canada. Over the last few years, driven in part by tax incentives, Babel Media has been refocusing its business away from its UK base to its Montreal office. The company was acquired in 2008 by global outsourcing firm Quattro.

PlaySpan: USA–based PlaySpan is a leading online games billing and payment services specialist founded in 2006 and sold to Visa in early 2011 for $190m. Several factors make PlaySpan interesting.

Firstly, the company was founded by a 12 year-old, Arjun Mehta, (albeit with the help of his father who became its CEO). Secondly, PlaySpan is probably the most widely used games payment solution supporting well over a thousand games titles. Following several rounds of VC financing and a number of acquisitions, PlaySpan quickly expanded its services and now offers a broad suite of services tailored specifically for network games companies from payment fulfilment (supporting 85 different payment methods worldwide), bespoke payment cards sold at retail, in-game and out-of-game virtual good marketplaces, and a white label Android app store.

List of key genres

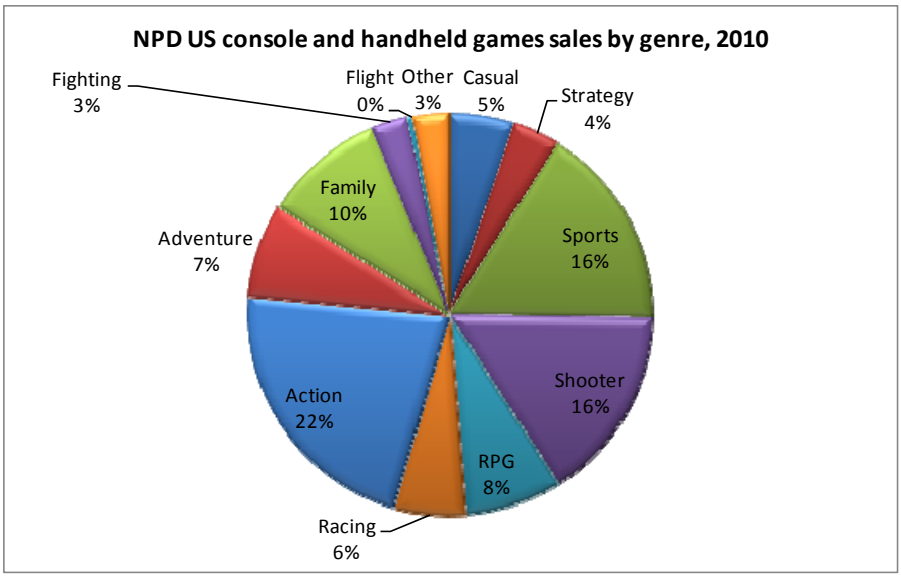
Services work with all game genres for all platforms.

2.3 Games Content

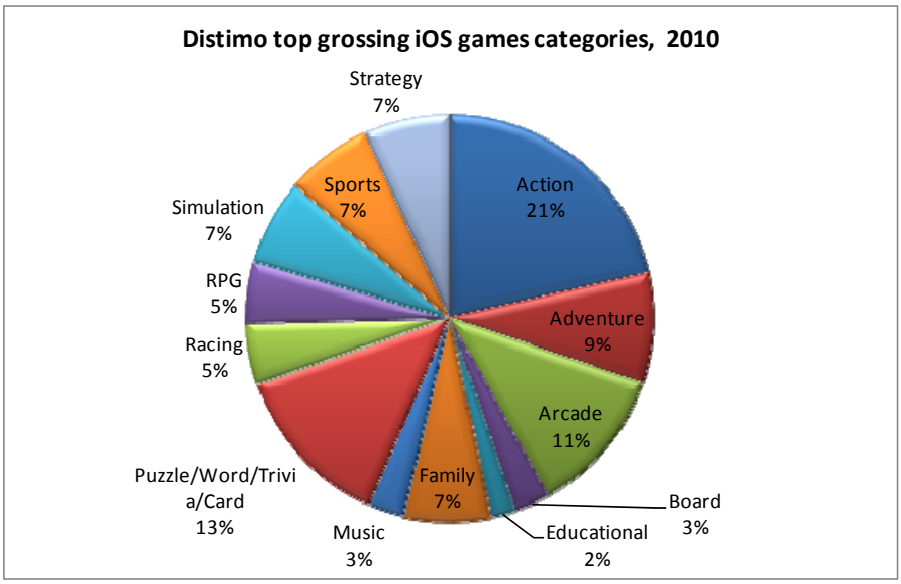
Introduction

Games have always been categorised by the type of gameplay they feature, the platforms they are available on and their setting and content. Game genres are mostly defined by gameplay type but incorporate elements of the other categorisations and are typically broad enough for many games to incorporate several genres. Whilst most genres have undergone substantial changes over the years due to the growing sophistication of games and network technology, others have remained notably unchanged (such as card games) or are constantly changing as new variations on a common gameplay theme become popular (such as puzzle games). In addition, games genres' relative popularity has risen and fallen over the years, occasionally due to the obsolescence of old technology and advent of new technology.

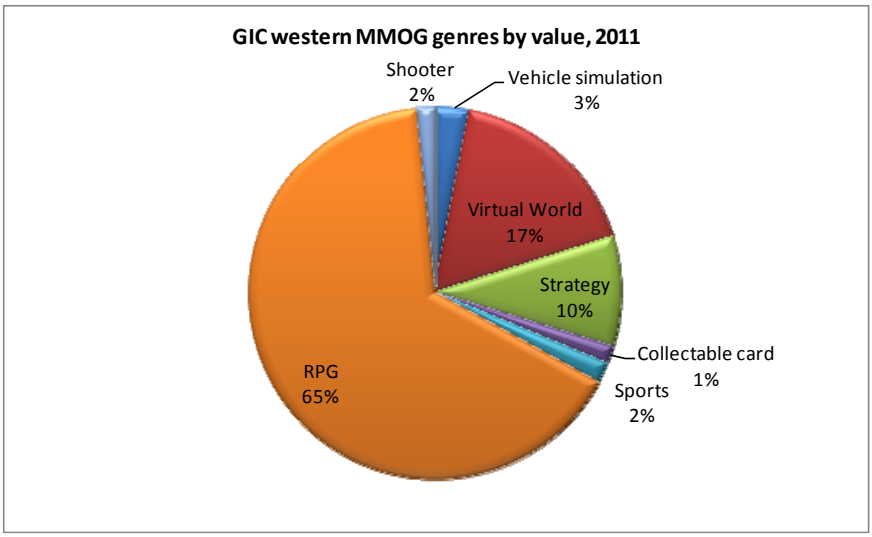
Many platform companies, retailers and research companies provide sales data or charts based on genres (some of which are presented below).



Source: ESA & NPD, 2011



Source: Distimo, 2010



Source: Games Investor Consulting, 2011

However, few provide concrete definitions for them and none are identical, making comparisons between them highly misleading. We have therefore supplied our own broad definitions and detailed key games genres' history and current status.

2.3.1 Role-playing games (RPGs)

The highly stats-driven nature of pen-and-paper RPGs made their transition to electronic game form a natural development and RPGs were amongst the first computer games in the 1970s. RPGs are character-driven adventure games in which gameplay progress is typically measured through statistics and the accumulation of skills, virtual wealth and other virtual assets, all of which are gained through undertaking quests and combat. RPGs are usually based on fantasy and sci-fi settings but other settings have been employed. Their popularity in the west has, until relatively recently, been confined to computer platforms (mainly PC) where they have tended to attract a particularly hard-core male player base. However, Japanese console and handheld RPGs have always fared well commercially and many western specialist RPG developers (e.g. Bioware and Bethesda) have made successful moves into the console market over the last five years. The open-ended nature of RPG gameplay (essentially one of continual self-improvement) makes them well suited to network gaming and ongoing games services in particular. By allowing multiple RPG players to interact online and coordinate their play within the same game universe, the earliest online games developers were able to tap into a rich vein of compelling co-operative and competitive gameplay. As technology grew more sophisticated these early text-based multi-user dungeons (MUDs) became graphical massively multiplayer online RPGs (MMORPGs) capable of supporting hundreds or more concurrent players in vast open worlds. MMORPGs are very PC-oriented (and are the dominant category of MMOG) but mobile MMORPGs have become a rapid growth market in recent years too. Recent examples include World of Warcraft, Final Fantasy and Mass Effect.

2.3.2 Adventure games

Adventures are typically narrative-driven games in which players guide a character through a largely linear set of puzzle and dexterity-based challenges. Adventure games can be split into different sub-categories depending on their gameplay focus. Text adventures and point-and-click adventures, with an emphasis on puzzle solving and little or no dexterity challenges, enjoyed great popularity in the 1980s and the early part of the 1990s but are relatively rare in modern games. Action adventures have existed since the earliest consoles and remain very popular to this day with a strong emphasis on dexterity challenges (for example traversing chasms on a rope swing) as well as some puzzle solving (usually visual puzzles) and combat. Recent examples include Tomb Raider, Uncharted and Sam & Max.

2.3.3 Action games (including shooting, fighting and platform games)

The action game genre is one that has diversified enormously during industry history and has grown to overlap considerably with many other genres such as adventures, RPGs and even puzzle games. It is arguably the broadest of the games genres as a result and includes many different components. Broadly speaking, most action games' gameplay revolves around dexterity challenges and in particular hand-eye coordination and reaction times. More often than not, this gameplay is based on violent actions, either personal or vehicular combat. Shooting games were a mainstay of early arcade and video game consoles and have evolved from static screen 2D format (e.g. Space Invaders) to scrolling 2D (e.g. 1942) and on to 3D (e.g. Starfox). The advent of 3D technology has also given rise to a hugely popular sub-set of shooting games, the first-person shooter (FPS), which gives players the perspective of the (invisible) protagonist tasking them with despatching waves of foes to progress a story line using a variety of guns and other means. FPS games (such as the Call of Duty and Halo series) are typically the biggest selling console games each year but the same visual perspective and some gameplay elements are now common in RPGs too. Non-FPS shooting games remain popular sometimes, providing exactly the same gameplay but with the camera fixed behind the player's character. Another popular action game variant is the fighting or beat-em-up game in which players control a character which engages in hand-to-hand combat with one or more opponents. Fighting games' popularity peaked in the early 1990s as 2D titles but remain popular having made the transition to 3D (although from a third rather than first party perspective). Examples include the Street Fighter and WWE series. Finally, the platform game is also one of the earliest game genres and one that dominated multiple console generations until the mid-1990s. Platform games usually involve navigating a character around a set of obstacles to reach a pre-determined destination using dexterity and a degree of puzzle solving. Platform games are typically family friendly involving mild violence only. Examples include the Super Mario and Sonic series.

2.3.4 Sports games

Sports games are virtual recreations of existing sports and sporting events whose popularity and gameplay largely matches that of their real-world counterparts. Thus football, basketball, American football, golf and Olympics games tend to dominate sports games sales. Sports games have also existed since the earliest days of video gaming and have been consistently popular since. Examples include Pro Evolution Soccer and Mario and Sonic at the Olympics.

2.3.5 Vehicle simulations (including racing games)

Vehicle simulations put players in control of different types of vehicle and present them with challenges such as competing in races, completing a flight or engaging in vehicular combat. Vehicle simulations will often focus on realism (which differentiates them from other genres such as Action)

furnishing players with a complex array of virtual controls and often supporting specialist physical user interfaces such as steering wheels and flight sticks. Aircraft simulations were particularly popular during the early 1990s but have fallen since then. Train, submarine, boats and jet skis, tanks, robots and spacecraft have all been explored and many continue to be explored by games developers. However, arguably, only racing games have proven a popular part of every console generation's software line-up. The earliest examples of racing games date back to the 1970s (e.g. Astro Race). Whilst the aesthetics of racing games have changed in line with the growing sophistication of games hardware, core gameplay of racing games (competing in time trials and races against human or computer opponents) has not but this has not diminished racing games' popularity significantly. Racing games are not confined to existing automobiles but also include fantastical vehicles (e.g. the Wipeout series of sci-fi racing games) as well as comedy variations of existing vehicles (e.g. Mario Kart).

2.3.6 Strategy games (including god sims and life sims)

Strategy games' origins lie in board games such as Risk and typically give players a macroscopic task such as growing a civilisation or defeating an enemy which must be achieved by managing an array of more microscopic variables such as troop positioning and resource gathering, sometimes controlled indirectly only by the player. Although some games can be fast-paced such as real-time strategy games (RTS) like the Starcraft series, many are slower-paced requiring many hours or more to complete. Strategy games can be broadly split between military strategy games, economic management games (god sims) and artificial intelligence games (life sims) although all can employ elements of the others. For example, military simulations can often involve economic management (e.g. resource gathering and use) but these are secondary to the primary aim of these games – giving players the role of a military chief tasked with defeating an enemy. This category is dominated by RTS games which are almost exclusively found on PC and have an eager following in particular in Korea where the original Starcraft became a national sport, with its own TV channels and player celebrities. God sims on the other hand often involve no violence and give players the role of managing the growth of a project whether small (e.g. a lemonade stand business in Lemonade Tycoon) or large (managing the economic expansion of a city in the SimCity series or the evolution of a civilisation in the Civilisation series). Players achieve these goals by harnessing existing resources to allow greater resource collection (e.g. chopping wood to create more tools to allow more wood to be gathered etc.). Finally, life sims gives players control of one or more artificial entities tasking them with nurturing and evolving them. Life sims rely heavily on artificial intelligence and often give the players limited direct control over the entities but more control over their environments. Examples include The Sims and Spore. Both god sims and life sims are mostly PC based but have also made successful transitions to mobile/tablet and handheld (most notably Nintendogs) and to a much lesser degree console. Life sims have always appealed to non-core gamers (in particular young girls) whilst god sims have enjoyed a huge surge in popularity amongst non-core gamers (in particular older women) on Facebook.

2.3.7 Collectable card games

Collectable card games (CCGs) are based on the use of physical or virtual card decks acquired in randomised packs and typically used in multiplayer competitions. The cards have unique gameplay properties (such as attack points, spells or defensive benefits) which can usually be applied at strategically advantageous points in the game to defeat an opponent or make some other form of progress within a game. The collectability comes from artificially applying scarcity to the card supply; the most powerful cards are extremely rare whilst the least potent cards are the most common, leading to secondary market trading which is often encouraged by the CCG developer. The biggest

CCGs, such as Magic Online, Battleforge and Urban Rivals are forms of MMOG with huge online player communities, matchmaking and communal play areas. CCGs origins are in baseball cards and Top Trump card games but their virtual equivalents date to the late 1990s. Magic Online (2002) dramatically accelerated the popularity of the genre although it remains relatively niche with a narrow core audience (male 10-25 year olds).

2.3.8 Puzzle games

All puzzle games involve the solving of logic challenges. Whilst some are solved using mental agility alone, others can incorporate dexterity challenges too. Puzzle games often feature extremely focused gameplay with little variation besides context changes and minor gameplay rule changes. For example, the original Tetris, one of the most popular video games of all time, comprises the same random shape stacking gameplay but presents different challenges by varying the speed at which the shapes descend the screen. In recent years, physics simulation has featured heavily in many of the most popular puzzle games such as Portal and Angry Birds giving players the task of anticipating the response to a set of simulated physical stimuli (such as propelling a character through a series of gravitationally different circumstances or catapulting an oversized bird at a particular point on a ramshackle wooden construct). Another popular category of puzzle game is hidden object games which are visual searching games where the player must find items within highly cluttered, static 2D scenes. Hidden object games have proven particular popular over the last 4 years as casual PC downloads by older female players. Puzzle games are often based on very simple ideas necessitating relatively simple development and so have been produced in great volume for much of games industry history but in particular in the last 3 years as open platforms has reduced the barriers to development and self-publishing even further. Puzzle games are one of the few genres to produce games with genuinely universal gamer appeal, their accessibility and simplicity making them highly suitable for non-core gamers and the challenge of mastery making them suitable for core gamers.

2.3.9 Card, word and board games and quizzes

Card, word and board games and quizzes are often derived from real world equivalents such as Solitaire, Scrabble, Monopoly and Trivial Pursuits. They are typically found on casual online games portals and on open platforms such as smartphones, tablets and social networks but some (such as Buzz and Uno) make successful transitions to console where they are pitched as family friendly communal games. This category features a wide range of gameplay but the games are rarely complex and often, like Puzzles, feature a simple core gameplay mechanism (such as anagram solving) that is repeated with little or no significant variation. Despite their simplicity (and the relative ease with which they can be developed), the historic popularity of these games is inextricably linked to the rise of mass market platforms such as connected PCs, smartphones and social networks. As such, this category is currently hugely popular and likely has a player base to match any in this taxonomy.

2.3.10 Music and dance games

Music and dance games share much in common with puzzle games featuring gameplay that is a combination of physical dexterity and, to a lesser degree, memory strength. Most music and dance games' gameplay revolves around following on-screen instructions either with a gamepad, a peripheral (such as a guitar) or with one's body (i.e. completing dance moves or singing a song). The instructions are typically linked to a music track (e.g. playing the guitar track) or visual cues (e.g. a dancing avatar) which reflect the players' success (or lack thereof) with points scores and positive

exclamations or music track distortions or negative exclamations. The more complex games modes require not only considerable skill but also memorisation of the instructions. Peripheral-based music games have been around since the late 1990s but boomed in popularity on console in the mid 2000s with titles like Guitar Hero and Rock Band. Market saturation and the failure to evolve beyond the same instruction-following gameplay have seen music games sales collapse in recent years. However dance games have picked up much of this slack and are currently enjoying their own boom with titles like Just Dance and Dance Central.

2.3.11 Casino games

Since the focus of this report excludes gambling, casino games in this context represents games of chance which do not incorporate either consideration (i.e. a real money wager) and/or real money rewards. Such games are often found on the same casual online games portals as card and word games (e.g. roulette games) or on social networks (e.g. Zynga Poker) where they are mainly funded by advertising and virtual currency purchases. As the demographics of gamers has expanded and grown, so has the overlap with traditional gambling. This has resulted in a growing level of cooperation between what have been, and will for the foreseeable future remain, extremely disparate industries. While companies have borrowed gameplay ideas from each other (there is clearly major games design and development skills overlap between gambling and casino games), gambling companies have been making investments and acquisitions in games companies in recent years such as Harrah's acquisition of a majority in social network games company Playtika, 888's acquisition of Mytopia and Betfair's investment in Kabam. There are no instances of games companies buying gambling companies although Zynga did acquire MarketZero, an online poker player stat tracking company. These transactions represent only a tiny segment of the games M&A market to date but this could change if gambling is legalised in the USA a move which might precipitate not only a rush of M&A by gambling companies to acquire suitable audiences but also a move into gambling by existing games companies with strong casino games portfolios such as Electronic Arts and Zynga.

2.3.12 Skill Games

A related category of gaming which is less a genre and more a business model distinction is skill gaming. Skill gaming allows players to wager on their ability at a game and the chance to win money. Skill games are almost exclusively the preserve of the casual online games player (i.e. dominated by older female players) and feature games from all casual genres (in particular card, word and puzzle games) which have been adapted to have all material elements of chance stripped out. This has the effect of making them a form of legalised gambling which is permitted in most major EU countries and US states. However, skill gaming's legality has, to our knowledge, yet to be tested in any senior courts. It is a very grey area whose boundaries are rarely defined clearly in law, are interpreted differently by different skill games companies and countries, and are constantly being pushed. For such a small market, most governments have not looked hard at skill gaming, and there are low or no barriers to entry for the location of skill games servers, which in many markets do not appear to require any kind of license. An exception is Germany, which allow but regulates skill gaming quite closely, and formally certifies the individual titles of skill gaming companies, such as GameDuell, that provide services to German players.

The skill games market originates from the late 1990s, has remained almost exclusively PC and casual games focused and has never exceeded around $250m in annual value. Attempts have been made by well over a dozen companies to extend the skill games model either to other platforms (such as Virgin Gaming on console) or to hard-core PC gaming (such as Ultimate Arena). However all but Virgin Gaming (which is a relatively recent venture) have failed because the services featured games that

were too skill-based and competitive (i.e. casual players were highly unlikely to win anything), were very prone to hacking and cheating, and failed to generate sufficient player scale to maintain high enough tournament turnover. The skill games business model, irrespective of game type, is highly dependent on momentum and scale, and has led to the market being effectively dominated by just 3 companies: USA-based Worldwinner (part of GSN), UK-based King.com and Germany-based Gameduell. These companies develop and publish their own games (sometimes based on external licenses) but distribute their services both directly via their own web sites and via third parties such as Pogo (Worldwinner) and Yahoo (King.com). The skill games market has stagnated in recent years as the player base has been cannibalised by the growth of social network gaming which targets the same demographic. All three of the major skill games market leaders have been refocusing investment towards developing and growing their social network games services as a result.

2.3.13 Serious games

Serious games are games designed for a primary purpose other than (or alongside) entertainment and which are usually intended as educational or instructive tools. Serious games are themselves not really a distinct game genre and comprise gameplay that firmly fits into other genre categories, often strategy games (simulations of various sorts) and puzzles. Serious games have long promised to revolutionise education and information dissemination but have consistently failed to deliver a market of material size. The reasons for this are manifold. Firstly, serious games are rarely intended as commercial releases and so suffer from limited budgets which often stifle their production values and ultimately their appeal. Secondly, getting the balance between the serious intent of the game (e.g. education about genetics) and the gameplay appeal is extremely difficult; the most widely disseminated and popular games are often the least educational. Finally, by pitching entire games on single subjects to deeply risk-averse, non-games clients like governments, serious games companies typically fail to win consistent and thus sustainable business. However, there are some exceptions, mainly where serious games and consoles have intersected to form self-improvement games, or in the field of military simulations. Nintendo has been particularly successful at designing and selling Wii and DS games which are close to the border between serious games and entertainment games but still incorporate enough to warrant their inclusion in this category. Examples include Dr. Kawashima's Brain Training, Wii Fit and America's Army.

2.3.14 Gamification

Often mistakenly assumed to be a subset of serious games, gamification cherry-picks discrete elements of games – gameplay mechanisms, community-building principles, marketing methods, analytics – and applies them outside of games to a very wide variety of activities, from education, e-commerce, TV show communities and real-world exercise. This injection of game elements into non-games services such as web sites can target serious games purposes but differs fundamentally by not attempting to create entire games. Web sites are 'gamified' to boost user engagement, loyalty, numbers, and, in many cases, commercialisation potential. The concept of gamification may not be particularly new but it has become increasing popular over the last few years and a score of specialist gamification companies have been established in the west. These companies have been finding clients from an extremely broad variety of clients from FMCG and food manufacturers to TV and mobile networks. Determining the value of this success is impossible as both client base is already too broad and the commercial benefits for clients are often too intangible or indirect to be measured.

2.3.15 Latency and games content

The speed with which players are able to interact with a network games server (and other players) is important for only two categories of gaming: video stream-based games-on-demand (discussed earlier) and synchronous multi-player gaming. The latter comprises limited multiplayer online games, such as Battlefield 2 and Team Fortress in which players compete or co-operate head-to-head with other players in real time, and MMOGs (also discussed earlier). As such, all genres with synchronous multiplayer components are latency-dependent, most commonly the shooter, RPG, strategy, action, sports and vehicle simulation genres. Publishers can reduce player latency through multiple methods including the use of peer-to-peer network technologies (for which data bypasses central servers and travels between players only) and distributed server topologies that ensure that the majority of players access geographically local servers. Cloud gaming (such as Onlive) when used for video stream-based games-on-demand and synchronous multi-player gaming can be impacted by latency depending on player distance from host servers. For clarification: Casual Online Games, Social Network Games and Mobile and Tablet games in general are not impacted by latency due to the data packets being much smaller.

2.4 Main international locations of digital game production and operation

Major and minor global locations for games development are listed here.

Territory	Location	Description	Leading companies
USA			
Major	San Francisco	Centre of the US online, and particularly social, games industry. Strong relationship with Silicon Valley technology and venture capital communities.	Zynga, EA Maxis, Foundation 9, DeNa ngmoco, LucasArts, Disney Playdom, EA Playfish, Sega, Activision, Bigpoint, RockYou, Digital Chocolate, Sony Computer Entertainment America, Capcom, Koei, Trion, Crowdstar, Stormfront, Outspark, Kongregate, Koei, Kabam, Atari, Glu, Square Enix, Secret Level, Vicarious Visions, Take Two, Aeria, iWin + Apple and Facebook
	Seattle	A cluster populated by console manufacturers and console game developers, at the heart of which is Microsoft.	Microsoft, Valve, Monolith, Nintendo, Bungie, EA PopCap, Big Fish, Zipper, Foundation 9, WildTangent, Valkyrie
	Los Angeles	Home to most North American publishers, most of whom locate their headquarters here. Also home to many studios, several of which have been acquired by publishers. Some online publishers also located here.	EA, THQ, Disney, Activision Blizzard, Gamers First, Foundation 9, Nexon, Warner Brothers, Sony Online Entertainment, Luxoflux, Naughty Dog
	New York	The east coast hub for some US publishers, with a number of publishing outfits sales and marketing divisions, but lighter on development. As New York	Take Two, Large Animal, Arkadium, THQ, Oberon, Big Huge Games, RealNetworks, Paradox, Playmatix, OMGPop, Gameloft, Rockstar

Territory	Location	Description	Leading companies
		is a new media cluster, it is thus the location of some online games companies.	
	San Diego	A hub of major game development, with a few major development studios.	Sony Online Entertainment, Rockstar, THQ, Trion
	Texas	Centred in Austin and Dallas, Texas has become one of the larger US locations for online games development.	Sony Online Entertainment, Disney, Zynga, Vigil, Spacetime, Ion Storm, Blizzard, Trion, Wolfpack, Bioware, Gearbox, Bonfire, NewToy, id, SouthPeak, EA Sports
Minor	Boston	Another modestly sized AAA game development cluster.	Harmonix, Turbine, Irrational
	North Carolina	Another AAA game development cluster.	Epic, Insomniac, Ubisoft, Funcom, Red Storm, Icarus
	Florida	A sparse cluster growing with state assistance for a few major companies.	EA, Artix
Japan			
Major	Tokyo	The near-exclusive centre of the Japanese games industry, for development, publishing, social networks and, historically, console manufacturing.	Sony/SCEI, Konami, Sega, Square Enix, Namco Bandai, Polygon Magic, DeNa, Gree, Mixi, Nintendo, Kojima, Polyphony, Atlus, Media Vision, Bethesda
Minor	Kyoto	Nintendo's headquarters with a very small number of satellite developers.	Nintendo, Tose
	Osaka	Capcom's centre of operations with satellite studios.	Capcom, Platinum Games, Yuke
China			
Major	Shanghai	The heart of China's games industry, both for development, online game service management and outsourcing to international partners. 60% of China's games revenues derive from here.	Giant, NetDragon, Shanda, the9, 9You, Ultizen, Sina, 51, 5 Minutes, Ubisoft, Activision, Square Enix, Epic, CCP, Disney, EA, EA Playfish, Virtous
	Beijing	The centre of China's social network games industry.	Renren, Netease, Perfect World, Rekoo, Changyou, Zynga, Elex
Minor	Shenzhen	The home of Tencent 9abnd thus China's largest social network), but little else.	Tencent, ZQ Game
	Hong Kong	A minor Chinese cluster growing out of the city's film and television production capability.	6 Waves, Capcom

Territory	Location	Description	Leading companies
Korea			
Major	Seoul	Almost all Korea's many games companies (most of them publisher/developers) are located in this metropolis	Nexon, Gravity, NCsoft, NHN, Hanbit, Gamevil, Grigon
Canada			
Major	Montreal	One of the world's largest and fastest growing development clusters, successfully built by over a decade of subsidies. Home to some of the world's largest studios, typically global publisher studios developing AAA console games	Ubisoft, EA, Square Enix, Gameloft, Babel, Ludia, Behaviour, Frima, Activision, Enzyme labs, Sarbakan, THQ, Warner
	Vancouver	Canada's second largest but first game development cluster with roots in film/TV production outsourcing from Hollywood.	EA, THQ, Activision, Next Level, Foundation 9, Capcom, Ubisoft, Slant Six, Mainframe, Take Two, Hothead, Microsoft
	Toronto	A newer cluster successfully copying Quebec's massive incentives.	Ubisoft, EA, Digital Extremes, Koei, Take Two, Digital Shock, Silicon Knights, Autodesk, Fuel, Artech,
UK			
Major	London	The largest UK games cluster. Home to development and several publisher studios, many independents and publishing European HQ for many leading global publishers' sales and marketing organisations.	Sony, Square Enix, Sega, Warner, Kuju, Playfish, Splash Damage, Slightly Mad, Miniclip
	Guildford	The second largest UK games development cluster by headcount, with many console and mobile studios deriving from EA's two local and shrinking studios and Microsoft's Lionhead.	EA, Lionhead, Kuju, THQ, Supermassive, Zynga, Sega, SCEE
	Brighton	The UK's third cluster of largely AAA console developers and a new flush of mobile and social studios.	Climax, NCsoft, Babel, Relentless, Kuju
	Warwickshire	Another development cluster, largely focused on AAA console development.	Codemasters, Blitz, Microsoft, Activision, SCEE, Playground, FullFat
Minor	Cambridge	One of the few UK clusters with online as well as console expertise.	Jagex, Frontier, SCEE, Ninja Theory, Exient, Gameware

Territory	Location	Description	Leading companies
	Edinburgh	The home of Grand Theft Auto, but little else.	Rockstar North
	Dundee	A cluster heavily damaged by the loss of large studio Realtime Worlds.	Denki, eeGeo, Proper Games, Tag, Ruffian
	Derby	A modestly-sized cluster of independent console developers.	Rare, Free Radical, Eurocom, Strawdog
	Newcastle	A minor cluster heavily impacted by the loss of some publisher acquired studios.	Ubisoft, Eutechnyx, CCP
France			
Major	Paris	The heart of the French games industry, home to most French publishers and many studios. Benefits from public and private funding sources.	Ubisoft, Gameloft, Quantic Dream, Focus, Spil, Lexis Numerique, Darkworks, Nexway, Autodesk, Eugen
	Lyon	France's second hub for console development.	EA, Atari, Eden, Widescreen, Arkane, Smackdown
Minor	Montreuil	Ubisoft's global headquarters, with satellite studios.	Ubisoft, Neko
Germany			
Major	Hamburg	The heart of Germany's substantial online games industry, largely focused on PC, which has grown almost entirely organically.	Bigpoint, Innogames, Gamigo, Astrum, Fishlabs, Intenium, Splitscreen, dtp, Exit
Minor	Berlin	A PC development and publishing cluster, with a more recent online games cohort.	Radon labs, Gameforge, Neonga, Yager, Morgen, Wooga
	Munich	A PC and console development cluster.	Coding Monkeys, Deep Silver / Koch, Travian, Kalypso, NXN, Shin'en
	Frankfurt	Another console development cluster, and home to Nintendo's European headquarters (all sales and marketing).	Crytek, Keen, Nintendo
Scandinavia			
Major	Helsinki	A new centre of mobile and online games development and publishing.	Rovio, Housemarque, Applifier, Remedy, Sulake, Apaya, Digital Chocolate, Recoil, RedLynx
Minor	Sweden	A concentrated PC and console development hub	EA Dice, Avalanche, MindArk, Paradox
	Denmark	A minor console development hub	Square Enix IO Interactive, Deadline

Territory	Location	Description	Leading companies
Australia			
Minor	Victoria	Small cluster of mobile and former console studios damaged by major studio Krome closing down late 2010.	EA, Torus, Big Ant
	Sydney	A console and online game development hub.	Perpetual, Take Two Team Bondi, Nexon, BigWorld
Eastern Europe			
Minor	Russia	A small cluster of Russian developer/publishers.	Playrix, Astrum, Nevosoft, Nival
	Budapest	A mobile development centre for Disney.	Disney
	Ukraine	An outsourcing hub with a few large service companies.	Nikitova, Program Ace, Ulysses
	Warsaw	Poland's nascent PC and console development hub.	City Interactive, CD Projekt
India			
Minor	Bangalore	The software development capital of India with a small handful of games companies.	Dhruva, Zynga
	Mumbai	India's second software development hub benefitting from crossover from TV/film production.	Indiagames, UTV Ignition
South Asia			
Minor	Singapore	A small cluster of support staff but few developers, despite major incentives.	Tecmo Koei, LucasArts, Ubisoft, IGG, EA, Playware.
Rest of World			
Minor	Ireland	A cluster of sales, marketing and support operations for global publishers with a small number of developers.	Jolt, Tencent Riot, Activision Blizzard, Zynga, Nephin, EA PopCap, Big Fish, Gala Networks
	Argentina	A recently emerged centre for Latin American online and social games companies.	Disney Playdom, Vostu, Metrogames
	Brazil	A cluster housing largely support functions for global brands.	Vostu, Nintendo, Sulake

2.5 Cultural and social benefits of games

This report section will provide a brief overview of the cultural and psychological impact of games, including games' cultural roots and credentials, a rapid tour of the arguments for and against games and an overview of games' use in education and the workplace.

2.5.1 Cultural impact of games

Computer and video games have a wide number of cultural impacts on our societies. As they have become a mass-market entertainment medium used in between 40 to 70 per cent of western homes, many games exemplify their culture of origin, reflect but also influence older creative industries and have received recognition as a cultural industry from a wide range of international cultural and governmental organisations.

- **Games reflect their originating culture:** Video games are the products of teams of creative people that often reflect the culture within which they are developed. The language, artistic styles, dialogue and characterisation, humour, music, buildings and landscapes, political persuasion, social mores and ethics (or the lack thereof), social science and heritage in a video game can strongly reflect the environment or society in which the developer works. For instance, Japanese video games are often highly idiosyncratic and specifically Japanese in cultural terms, most notably in their use of a common aesthetic style (manga). Various studies have suggested that video games can be cultural artefacts of their originating societies[23], but this cannot be considered universal. One study in Canada found little that was culturally Canadian in Canadian-made video games[24].
- **Games reflect other cultural industries:** Video games have derived from other cultural industries since the early days of the video games industry. Films, television and books have all been the inspiration for video games. Since the mid-1990s, most Hollywood blockbusters have been accompanied by a parallel release of a video game based around the same intellectual property (IP). Television has been the source of many video games to varying levels of success. From children's shows, game or quiz shows, to drama and even comedy, games companies have licensed the IP for exploitation. Video games such as the billion dollar franchise Guitar Hero (over 25m units sold) make video games out of popular music. As video games scores get more accomplished and complex, celebrated film composers such as Danny Elfman and Hans Zimmer have begun working in video games. Video games have long borrowed indirectly or directly from literature and popular myth[25]. Many video game adaptations of literature exist, from Conan Doyle's Sherlock Holmes to Robert E. Howard's Conan. An entire genre of video gaming, role-playing video games, would not exist without J. R. R. Tolkien, which is source of continual inspiration for video games designers and writers.
- **Games display many cultural characteristics:** The characters and subject matter of some video games can be demonstrated to have strong cultural impact. Video game characters, from Pacman and Mario to Halo's Master Chief, have become cultural figures in their own right. One of the most iconic, Lara Croft from Tomb Raider was even used as an ambassador for British scientific excellence by the UK government[26]. Despite its American subject matter, the controversial but hugely successful Grand Theft Auto series evolved into a uniquely British video

[23] A collection of such studies is listed in the article "Video games as Cultural Artefacts", Patricia Greenfield, University of California, *Journal of Applied Developmental Psychology*, 1994, Volume 15.
[24] According to Leonard Paul, a researcher from the Vancouver Film School, "Currently, there appears to be little distinction in content for video games which are produced in Canada and the lack of any sort of "national identity" that can be drawn from the content of Canadian video game products". See Leonard Paul, "Canadian content in Video games", (Vancouver Film School, 2005).
[25] Douglass Perry writes engagingly and at length about the influence of literature and myth on video games http://uk.xbox360.ign.com/articles/704/704806p1.html.
[26] "I want Lara Croft of Tomb Raider to be an ambassador for British scientific excellence." Lord Sainsbury, November 1998.

game, characterised by ironic humour, seminal music and arch cultural commentary on snapshots of moments in American history[27]. It has been the subject of academic study and political debate, and set numerous video games design, narrative and development precedents.

- **The creative process of games design:** Video games production involves many disciplines such as music, sound design, lighting and scriptwriting that have strong analogues in film and television production. However, the one discipline that is unique to video games, and critical to a video game's success, is gameplay design. Games design is the process of designing the flow of interactive elements across an entire video game world that first teaches, then hooks but must entertain the player during the 1100 or more hours that players will typically play a video game.
- **Narrative in video games:** Another partial analogue to traditional entertainment media is video games scriptwriting and narrative. While by no means as central to the success of video games as a good script is to a film or television programme, a good narrative is, in certain genres of video game, becoming increasingly important to their commercial success. As video games have risen in graphical quality, so consumers have begun to expect a commensurate improvement in the characterisation and narrative that embellishes, provides context for or simply accompanies the gameplay. This gradual raising of the bar has seen increasingly complex multi-linear narrative arcs, requiring specialist games script-writing skills.
- **The expressiveness of video game art:** The quality of art within video games has started to equal that in the best animated films, but art in video games is more than simply a rising scale of fidelity or photorealism; it is an fundamental characteristic of the creative vision of a video game, and encompasses both the art style, the animation, the lighting and the design of the video game environment or world. Like cinematography and set design in film, art in video games can be breath-taking, moving, strongly manipulative of the player's mood and, at its heart, a vehicle for the artists' emotional expression.
- **Science in video games:** Video games development teams consist of writers, designers, artists and programmers, the latter two being the largest in number. Programming is a highly scientific discipline, one that usually requires degree-level maths or physics. These programmers must create relatively high levels of verisimilitude including realistic video game environments, real-world physics simulation and artificial intelligence. Science can be the subject matter of video games, for example in Spore players create and share organisms that evolve by Darwinian laws. Some video games use developers' deep knowledge of scientific principles to create new gameplay, such as the use of physics in Portal 2.
- **Video games' impact on other media:** In another indication of video games' cultural credentials, they have begun to influence other cultural media. Films now liberally borrow games IP, with over a dozen game to film conversions such as Tomb Raider and Resident Evil. The use of games themes (e.g. Tron) and rendering techniques (e.g. The Matrix's 'Universal Capture' cinematography) are common. Television also takes themes liberally from games. For instance, writers / directors J. J. Abrams and Damon Lindelof have stated that they deliberately modelled one of the biggest television series of recent years, Lost, on a video game world[28]. Some video games such as French MMOG Wakfu have an even closer relationship to television, launching as video games then spreading across multiple media including television. Broadcasters have also become major commissioners of games, from Discovery to RTL to the BBC (used to further its public service broadcasting goals). Video games have also inspired musical events[29], books[30], fine arts[31] and exhibitions[32], design[33] and children's toys[34].

[27] "The video game began to conjure memories of bygone days such as Vice City's 1980s Miami theme, and San Andreas' 1990s Los Angeles gang theme. GTA gradually added humorous "those were the days" features which both lauded and satirised US culture including radio stations, commercials, popular music and a dysfunctional urban environment." See *Playing for Keeps* (GIC / UKTI 2007).

[28] http://www.wired.com/gaming/gamingreviews/commentary/games/2006/02/70276

[29] EMI has organised a tour series called Video games Live, which features top orchestras and choirs including the London Philharmonic Orchestra.

- **Academic study of video games as culture.** Video games have long been considered worthy of study and have been the subject of many academic theses in the disciplines of both Humanities and Science. For instance, the Humanities Laboratory at Stanford in the USA has begun to catalogue video games. It has launched a research project called How They Got Video game, which explores the history and cultural impact of video games[35]. Another academic initiative is GameCODE, a research initiative founded to look at the cultural impact of digital video games[36]. Many books and studies on video games as culture exist, perhaps one of the more interesting being My Tiny Life by Julian Dibbell, which is credited as creating a virtual ethnography of online worlds[37].
- **Formal support for video games as cultural products:** The following bodies have recognised video games as cultural products: the European Commission[38], UNESCO[39], the French[40], Korean[41], Japanese[42], German[43], Nordic[44] and Canadian[45] governments, as well as the Spanish parliament and the US Seventh Circuit Court[46].

2.5.2 Psychological impact of games

As games penetrate further into western populations, an increasing number of academic, government and commercial organisations have studied the characteristics of gaming. Leaders in the field of video game research include: London Knowledge Lab, Futurelab, the Games, Learning & Society (GLS) Group, Digra and MIT. However, in general such research can suffer from the peer-review process lagging behind the technology's development and consumer usage. Much of the research is speculative, anecdotal, based on small-scale case studies, and researchers can make generalisations

[30] There are multiple books based on Halo and MMOG Eve Online.
[31] Artists such as Cory Arcangel, whose work has been exhibited at the Guggenheim Museum and the Museum of Modern Art in New York, have been influenced by video games.
[32] the Pixel is a travelling exhibition of art from video games curated by the Academy of Interactive Arts and Sciences and the Los Angeles Museum of Art. A range of video game art exhibitions have been featured in galleries such as the San Francisco Museum of Modern Art and Whitney Museum of American Art.
[33] The Victoria and Albert Museum has a Residency in Digital Design which includes video game artists, and runs digital design workshops including video games for young people
[34] Such as Pokemon and, more recently, Moshi Monsters.
[35] http://www.stanford.edu/group/shl/cgi-bin/drupal/?q=node/7.
[36] The project has attracted scholars from UQAM and Universite de Montreal, http://ctr.concordia.ca/2003-04/mar_18/04/.
[37] For lengthy discussions on video games, culture, literature and art, see http://firstwallrebate.com/
[38] "We can, therefore, conclude that certain video games could constitute cultural products." Commission Decision of 11.XII.2007 concerning State Aid C 47/2006 (ex N 648/2005) tax credit set up by France for the creation of video games (The Commission of the European Communities) Brussels, 11.XII.2007, C (2007) 6070 final.
[39] http://portal.unesco.org/culture/en/ev.php-URL_ID=2461&URL_DO=DO_TOPIC&URL_SECTION=201.html.
[40] France is the first EU government to instate a tax relief for cultural video games which qualify under a cultural test agreed by the European Commission
[41] The Culture, Sports and Tourism Minster Yu In-chon announced a government investment programme to assist with the export of Korean video games.
[42] The cultural affairs agency has requested funding for a £75m National Media Arts Centre to promote Japanese pop culture (including video games) abroad.
[43] the German Cultural Council officially accepted video games as a form of culture, and a constituent of the film and audiovisual media subsector. The Council urged the government to support video games development, which prompted the Minister of Culture, Bernd Neumann, to announce an annual prize for video games development worth €300,000 for video games content of German origin conforming to a high standard of cultural quality and pedagogical values
[44] The Nordic Council of Ministers (Denmark, Finland, Iceland, Norway and Sweden) have funded the development of culturally diverse video games from their region in order to correct an imbalance in the number of culturally Nordic video games available in their region.
[45] Telefilm Canada is a federal cultural agency dedicated to the development and promotion of the Canadian audiovisual industry**.** Telefilm funds the Great Canadian Video Game Competition, as well as administering the Canada New Media Fund on behalf of the Canada Heritage Department which has funded numerous video games projects
[46] The US Court of Appeals was asked to adjudicate the case of American Amusement Machine versus Kendrick. In 2001, Judge Richard Posner argued that the video game should be considered an art form, since it shows thematic and expressive continuity and is at least as effective as other popular arts that are considered protected speech under the First Amendment of the US Constitution

about gaming by looking across multiple media[47]. The widest review of the research in recent times, the UK government's independent study into video games, the 2008 Byron Review, found no conclusive evidence that video games harm children and noted they can have some beneficial effects. It also found that use of video games and the internet is extensive amongst children but the existence of inappropriate material raises the need for stronger classification and parental responsibility.

Arguments for gaming

Beyond the obvious entertainment value of gaming, the main benefits of video gaming have been argued as follows:

- **Hand-eye coordination**: Early studies (Herz, 1997) discussed how games develop motor skills and reaction times. Later studies (Green & Bavelier, 2003) identified hand-eye coordination required for some games genres to progress. Another study found that physicians who played games for more than 3 hours per week made fewer errors and completed simulated surgery quicker (Rosser et al 2007).
- **Cognitive development**: Various studies have identified 'hard fun' (Papert 2002 and Gee 2003/7), matching and increasing the skill level to allow players to solve problems. Others (Johnson 2005) argue that successful games reward the right parts of the brain by setting and then overcoming challenges. Koster (2004) and Gee (2003/2007) argue that playing and learning are intimately connected and that long, difficult, and complex games typically incorporate good learning principles (some of which are based on complex cognitive development processes) in order to be learned and mastered.
- **Agency and player control**: Games are often empowered by self-discovery and player autonomy, in gaming theory termed 'agency' (Murray, 1997). Players are in control; they seek out tasks and decide how best to achieve them and, when faced with conflict and combat, learn how to overcome them. In no other media form is there such a high level of agency and personalisation.
- **Deep levels of immersion**: Immersion, as applied to gaming, has been developed as a metaphorical interpretation of a physical experience - that of being submerged in water (Murray, 1997). Immersing oneself in a game has tended to be oversimplified in the press to a state in which players 'lose themselves' in the gaming world and start to think that what they experience is reality (Salen and Zimmerman, 2003). One basis for an immersive gaming experience is Csikszentmihalyi's theory of flow (1990). 'Flow state' is the sense of enjoyment and exhilaration that comes out of, and sometimes despite of, circumstances and events in which we feel in control of our actions and 'masters of our fate'.
- **Simulated experiences and meaningful contexts**: Simulations can be used as cognitive tools, allowing users to test hypotheses without any real risk and thereby ground their understanding of their action in a situation (Laurillard 1993). Simulations have a unique ability to promote learning through the manipulation, variation and feedback of a system (Thomas and Neilson 1995). Gee (2009) argues that games design principles that associate and combine disparate objects to solve problems are also found in a growing body of learning science research concerning how people learn best.
- **Intrinsic value of content**: Learning theorists such as Piaget (1962) and Bruner (1962) argue the importance of intrinsically motivated play-like activities, epitomised by the fun of video games, for many kinds of deep learning. Some games can teach players about history via a historical context that is intrinsic to gameplay (Squire, 2004; Egenfeldt-Nielsen, 2005). Players

[47] Sefton-Green (2005, p. 419) points out that *"the absence of empirical observations or audience studies or good industry-based research only helps the texts float free in this speculative ether"*, while Condie and Munro (2007) concluded that overall the research evidence in relation to games and learning is very limited.

can learn (Squire 2004) how to devise strategies alone or in a team, interpret results of experimentation, refine, argue and communicate strategies with or to peers.

- **Playing together**: Console games have become increasingly family-related activities[48] whereas most network games, put players into direct contact with other players, on whom their play can have direct impact. This leads to new behaviour such as identity sharing (Wong et al 2009), group dynamics and mutually supportive activity (Chen 2009), and mutual learning patterns (Oliver and Carr 2009). Participation in MMOGs has been shown (Steinkuehler 2008) to entail complex forms of socially and materially distributed cognition, collaborative problem solving, novel literary practices, scientific habits of mind such as hypothesis testing, computational literacy and a variety of learning methods inside groups.
- **Social gaming**: Play on new networks has begun to be studied, including a range of motivations behind play on Facebook (PopCap 2010), social reciprocity in location based games (Grant et al 2007) and benefits of Augmented Reality (Kerewalla 2006).
- **Neuroscience and brain training**: Some researchers think games could improve cognitive flexibility (Goswami 2008) but some disagree (Greenfield 2003). Neither offers any empirical evidence. While other studies support the neurological benefits of gaming (Lieury 2009). Brain training has been found to have little impact in a recent large scale experiment (BBC Lab UK 2010).

Arguments against gaming

The media makes much of the dangers of gaming, but researchers highlight the danger of focusing on one new medium in isolation from a wider cultural context.

- **Addiction:** Video game addiction is argued as a valid concept psychologically similar to using slot machines (Griffiths et al 2009) but an overview of the available empirical literature within this study appears to indicate that adverse effects are likely to affect only a relatively small subgroup of players and that frequent players are the most at risk of developing problems. Ineffective time management skills may lie behind excessive video game play (Wood 2008) although Skoric et al (2009) found no linkage between scholastic performance and the time spent playing video games.
- **Violence:** This contentious area of debate has been the subject of many studies. One (Gosman et al 2009) argued that since the military use digital games in training for real life situations, so young people using similar games are being conditioned to be aggressive in their real lives. Others (Jenkins 2007) counter that assumptions about games outside of cultural context are dangerous and cannot be accurately measured. Repeated linkage between gun-related outrages and shooting games has occurred, most recently between the mass murderer in Norway who said that the Call of Duty game was good training, but no definitive answer has emerged. The media still commonly assumes that violent games are more popular than non-violent ones (Dietz, 1998; Funk & Buchman, 1996; Gentile et al., 2004).
- **Sedentary lifestyle and health effects:** The lack of movement when playing many types of game is blamed for declining health and increasing obesity rates in the general population (Stettler et al, 2004). While it is obviously true that outdoor physical sports have greater health benefits than passively playing most video games, it is far less clear whether video gameplay is the cause of any decline in physical activity, or increase in calorific consumption, in the population. Fromme (2003) provides empirical data to show that gameplay was generally one of a range of social and other activities for most players, and that television viewing – an even more passive and less interactive form of entertainment – was the main activity displaced by video game use.

[48] 82% of active European gamers with children played games with them, Source ISFE 2008.

- **Attention spans**: Neuroscientist Susan Greenfield claims that the more children play games, the less time there is for learning specific facts and working out how those facts relate to each other. (Cornwell 2008). Healy (1999) claims that the rapid pace of computer games is only stimulating basic 'fight or flight' sections of the brain rather than parts responsible for higher reasoning.
- **Transference from in-game to real world:** Arguably the most significant issue regarding video games and learning is the problem of transferring knowledge and skills developed in games (simulated experiences) to real world scenarios and encouraging the reflective and analytical skills needed to successfully apply learning from one scenario to another. Bottino et al (2007) describe a small-scale, but long-term, pilot project designed to foster strategic and reasoning abilities in young primary school pupils by engaging them in a number of relatively simple puzzle-based video games based on Mastermind and Battleship. Their research showed a strong correlation between the pre-defined ability of the student, and their performance with the game. In addition, the resulting data suggested that, even when low achievers (as categorised by the teachers) had understood the aim and rules of the game, they were not necessarily able to figure out and apply effective solution strategies.

2.5.3 Games in education

Van Eck (2006) points out that games have arrived in the classroom through three routes: having educators or developers design games from scratch, having students design games from scratch and integrating commercial, off-the-shelf (COTS) games into classroom learning. The former two categories, both of which can be classed as categories of serious games, are explicitly designed for learning and skill development. There is also a growing body of theoretical research suggesting that 'fun' (a positive state of enjoyment) can lead to 'better' learning (e.g. Bisson and Luckner 1996).

- **Serious Games:** Various studies have shown that the 'chocolate covered broccoli' approach (Bruckman 1999) works in theory but fails in practice by adding superficial fun but failing in comparison with commercial games (Facer et al 2003).
- **Use of commercial games in the classroom:** Much research has been undertaken into teachers use of commercial software in the classroom, such as creative problem solving in simulation games (Newman 2009) and conceptualisation of big ideas, time, scale and risk-free decision-making (Aldrich 2005), but commercial games cannot be purchased and immediately used in the classroom to gain a significantly increased improvement in academic attainment.
- **Use of games in further and higher education:** This is still a relatively rare occurrence but MIT's Comparative Media Studies department produced 'Biohazard: Hot Zone' to help students learn introductory college biology and environmental science (Squire, 2003). de Frietas (2006) reviews a range of games designed for teaching and learning with adults in further education or training, that reviews a range of successful and not so successful case studies, whilst Kirriemuir (2002) debates the benefits of deploying console-based games for teaching and learning in HE.
- **Gamification:** Games design principles (as opposed to entire games) have been applied to pedagogical design in a state-funded school in New York, called Quest To Learn, where games designers have utilised the tutorial and incentivisation mechanisms from games to influence explicit learning outcomes. Formal studies of the results of the practice have not yet been released.

2.5.4 Games in the workplace

Video games are becoming accepted elements of workplace training and continuing professional development in a number of disciplines, most notably in the military.

- **Navy**: The British Royal Navy invested £50,000 on 230 PlayStation Portables for its engineering technicians (Hurst, 2009). The devices carry bespoke games that aim to improve sailors' skills while at sea. The engineers who maintain the fleet's radar, sonar, VHF radio and communications systems receive the consoles three months before college-based training in order to prepare them, particularly in maths.
- **Army**: The British Army uses Nintendo DS handhelds for similar purposes. America's Army harnesses shooter gameplay to win new recruits for the U.S. Army, taking players from the rifle range to bombed-out desert cities. It gained more than 4 million registered players. Other military games focus on equally important survival skills, like Arabic language and etiquette. Users of the Rapid Tactical Language Training System can work through conversations with animated computer characters, rather than actual Iraqi citizens who might take offense at the wrong hand gesture (Weirauch, 2007).
- **Other professions:** HazMat:Hotzone was developed for US fire-fighters to learn how to respond to a chemical-weapons attack. Traders on Wall Street can learn the ins and outs of currency trading with Forex Trader, and college administrators can use Virtual U to develop financial management and leadership skills.
- **Leadership**: In the UK, the National College for Schools and Children Services has been using a leadership simulation called Virtual School since 2003 as part of its programme for middle leaders in schools (Reeve & Dale, 2005). The simulation allows heads of department to practise tackling possible leadership scenarios in a computer-generated school as part of a blended learning programme that includes face-to-face and project-based activities and online learning resources and communities.
- **Gamification**: Since 2009, a range of companies have sprung up that take games design, community and marketing mechanisms from games and utilise them in non-games applications such as TV audience communities, ecommerce, various loyalty schemes, employee engagement, crowdsourcing, army recruitment and education.

Chapter 3: Understanding FDI in the gaming context

Lead Authors: Rick Gibson, Nick Gibson.

Chapter 3.1: Anatomy of a games company

3.1.0 Introduction

In this chapter, we will describe the anatomy of games companies, including business models descriptions, game development and operation budget ranges, resource and functional structure of internal teams and external resource and technology requirements from external service providers. We will cover this for each of the sub-sectors from Chapter 1, and give a brief overview of each of the wide range of service company types.

Definitions
B2B: Business to business.
B2C: Business to consumer.
QA: Quality assurance.
Rendering: The creation of computer graphics, typically used to mean in real-time.
Physics simulation: Imbuing games environments and other assets with realistic physical properties such as gravity.
Artificial intelligence: Giving computer controlled characters the semblance of intelligence.
Content: The graphical (art, animation) and audio assets that go into a game.

3.1.1 Console, handheld and PC boxed product

B2C revenue models employed

The following B2C models are employed in this sub-sector:

- **Retail of physical products**: Games are sold by physical or online stores typically for $10-$60. Alternative models are used games where the retailer buys second hand titles for re-sale typically with a much higher mark-up than new games.
- **Network retail:** The sale of downloadable PC games direct to consumer is conducted by publishers, independent network retail stores and white label solutions at prices similar to those found at physical retail. The console network retail market is considerably less mature mostly comprising small form (short duration, low price) or back catalogue titles and downloadable content for existing titles that vary from around $2-$20.
- **Advertising**: A supplemental revenue source only, it typically comprises dynamically updated virtual hoardings placed within the game environment. Advertising is typically sold using the standard per 1000 impressions (CPM) model that delivers from $1-$15 CPM.

B2B revenue models employed

- **Retail of physical products**: Games publishers distribute the games direct to retailers or via external distribution intermediaries (who typically take 2.5%-15% of wholesale revenues) at largely fixed wholesale prices. As the retailer determines the final selling price, their share of gross sales can vary enormously from nothing or negative margin (i.e. a loss leader) up to around 50% (including sales taxes).

- **Network retail:** Network retailers/console manufacturers typically retain around 30% of gross sales with publishers keeping the rest.
- **Advertising:** External ad agencies, where used, retain 30%-50% of gross ad sales.
- **Development funding:** The vast majority of games are funded by publishers who pay the developers either a fixed fee or a royalty advance disbursed on a milestone basis. The former is assumed to contain an element of margin for the developer (rarely more than 20%). The latter can involve an element of revenue sharing after the advanced royalties (typically around 10%-30% of a publisher's net receipts) have been recouped.

Commercial performance

Typical gross revenue range: $4m-$40m (PC and handheld); $0.5m-$5m (small form downloadable PS3/Xbox 360), $20m-$80m (full Wii), $25m-$150m (full PS3/Xbox 360).
Typical audience sizes (unit sales): 0.1m-1m (PC and handheld); 0.05-0.5m (small form downloadable PS3/Xbox 360), 0.5m-3m (full Wii/PS3/Xbox 360).

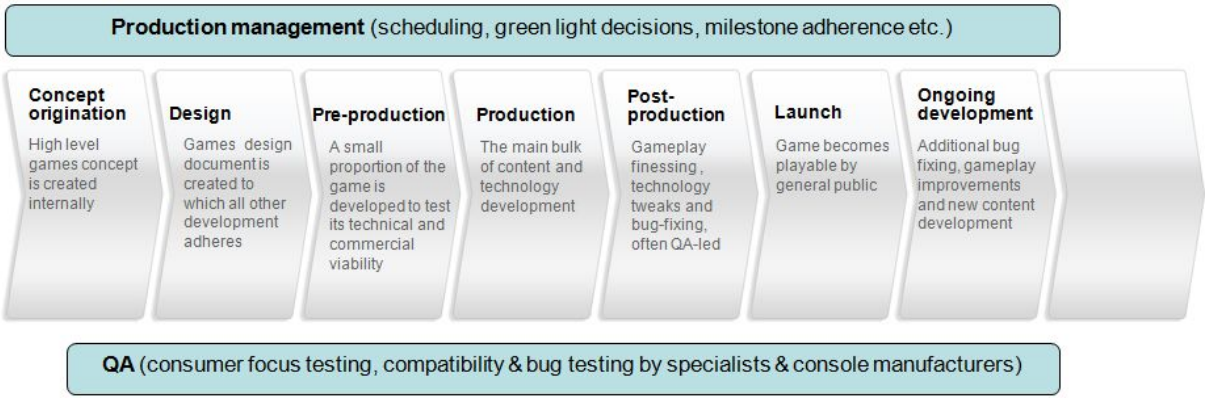
Development resources

The process of developing a console, handheld or PC boxed product game necessitates a number of roles fulfilled by both internal and external resources. Team sizes vary substantially based on project scale and platform between around 10 (e.g. for small-form console and handheld titles) and 100 or more staff (for full console releases). In the table below we define the major resources and associated skills needed. We have assumed a project headcount of c.50 for the number of staff column which would broadly be scaled up or down proportionately for larger or smaller projects.

Function	Skills	Responsibility	Number of staff	Technology requirements
Design				
The formulation of a game's gameplay structure, goals and tutorials as well as the environmental layout and story. Games designs guide all other development roles	Creativity, communication, project management, usually art or programming background, level design, story/script writing	Designer	3-4 part and full time	1st party level design tools
Programming				
The creation of technologies that make the game run; includes rendering, physics simulation, animation and artificial intelligence engines as well as user interfaces (i.e. control methods)	Programming, tool development, mathematics, physics	Programmer	6-10 full time	1st and 3rd party tools and middleware
Graphics				
The creation of the art and animation assets that make up the majority of a game's content.	Art and graphic design, use of art/animation tools	Artist	25-35 full-time + external resources	3rd party art tools, 1st and 3rd party animation tools and

Function	Skills	Responsibility	Number of staff	Technology requirements
				engines
Music and audio				
The music, voice acting and sound effects that make up the rest of the game's content.	Audio programming, music composition	Audio engineer, musician	2-3 full-time + external resources	1st and 3rd party audio tools
QA				
Consumer focus testing of games concepts and gameplay, and testing to identify technical and compatibility bugs	Market research, communication	QA manager	1-10 part-time + external resources	None
Localisation				
The translation of a game into different languages and to reflect the cultural sensitivities of different territories	Languages	Localisation manager	1 part time + external resources	None
Network				
Integration of network features such as leaderboards, achievement unlocks, multiplayer gameplay modes and incremental downloadable content	Network engineering, programming	Network engineer	2-4 full-time	1st and 3rd party network tools and middleware
Production management				
Producers ensure development projects adhere to budgets, schedules and quality expectations	Project management, leadership	Producer	1-3 full time	3rd party pipeline management tools
Senior management and admin				
Overall studio management including resource allocation, HR and finance	Leadership, project management communication, finance, HR	CEO, Admin	2-3 full time	None

The development process



The table above indicates the games development process for boxed games products. The stages are described below.

Concept origination: Games concepts can originate from any part of a development company (external origination is rare although games based on established franchises and external licenses can have prescribed games design features). Developers often encourage all their staff to submit new games concepts.
Design: The games concepts are then written up in high level and detailed design documents by specialist designers which define every aspect of the game and guide the work of every department throughout the development process.
Pre-production: A small number of staff from most development disciplines collaborate to create a functioning prototype of the game to test out the gameplay design, establish technical feasibility (and hurdles) and indicate early commercial viability.
Production: This phase is the longest-lasting and involves the greatest number of staff creating the technology and content of the game. It represents the majority of a development budget as a result.
Post-production: With the game largely complete, developers typically use QA and consumer focus testing to iron out remaining bugs, tweak gameplay, improve technologies and optimise performance. Console and handheld games must be sufficiently problem-free to pass stringent testing by the console manufacturers.
Launch: The game goes live and becomes playable by the general public via retail purchases or downloads.
Ongoing development: Increasingly, developers are allocating resource to fixing bugs found post-launch and developing new free and premium downloadable content, the larger examples of which have to go through a scaled down version of the full development process.

Development costs

Typical development costs for console, handheld and PC boxed product are presented below but vary based on platform and genre as well as developer/publisher ambition:

PC: $0.5m-$15m.

Handheld: $0.3m-$1.5m.

Small form downloadable PS3/Xbox 360 (known as PSN and XBLA games): $0.25m-$1m.

Full Wii: $3m-$15m.

Full PS3/Xbox 360: $10m-$40m.

Publishing resources

The publisher is the most important part of this sub-sector's value chain performing the following roles. To avoid significant complexity, we have not listed the functional structure of publisher teams, because they vary very widely depending on scale, number of titles in development, testing and released:

Development finance: The vast majority of games development in this category is funded by publishers, which is typically overseen on a day-to-day basis by brand managers in concert with producers. Some publishers utilise external project funding via completion bonds such as those provided by IFG (see Investment section earlier for more detail).
Production and QA: Publishers' use producers to oversee developer's work, handle QA and work in conjunction with developers' producer who perform an almost identical role.
Marketing: Marketing and PR (typically costing 10%-15% of net sales) is usually handled by a combination of in-house and third party experts who oversee advertising and sponsorship spending, undertake market research, liaise with games media, coordinate previews, reviews and interviews with the developer and publisher and any other promotional initiatives such as competitions, tie-ins with other media and point-of-sale material.
Manufacturing: As above, publishers undertake the manufacturing of PC games themselves via teams that oversee third parties including console manufacturers for console and handheld games.
Distribution: As above, publishers must oversee the distribution of boxed product games and their digitally distributed equivalents using internal and external resources.
Customer support: Publishers are tasked with providing support (technical, account etc.) to their customers but rarely invest anything other than a token amount in fulfilling this.

3.1.2 Mobile and tablet

B2C revenue models employed
The following B2C models are employed in this sub-sector. Hereafter, smartphone means smartphone and tablet games:

- **Network retail:** Almost all the market value for Java and over half the market value on smartphone is network retail, where consumers typically pay $2-$5 for Java games via operators' portals, and $1-$5 for smartphone games via app stores, often after trying scaled-down free versions of games.
- **Microtransactions:** Microtransactions on Java phones are still rare in the West but are increasingly valuable on smartphones. Typically, virtual currency is purchased in packs by consumers for $0.99-$50 either from app stores or within games via in-app purchasing. This is then redeemed in-game for virtual items and services.
- **Advertising**: Advertising inserted into entirely free titles (roughly a third of smartphone titles released) is an ancillary revenue stream and is almost non-existent for Java.
- **Subscriptions**: Subscription services that offer small numbers of Java games each month for c. $5 repeat fees are more common in North America and Japan, but are rare elsewhere. Subscription is a very nascent model on smartphone but has some potential.

B2B revenue models employed
Java: In the west, operators take 30-50% of gross revenues in return for operating and promoting game portals, and receiving payment for games. Publishers take the remaining 50-70%, rarely sharing <20% of net revenues with independent studios that developed the games. Relatively few independently developed and released titles are released on Java in the west.
Smartphone: Apple, Google and a range of other smartphone companies takes 30% of network retail and microtransaction revenues in return for operating and promoting app stores. Publishers and

independents take the remainder, plus any advertising revenues, usually sharing proceeds if a publisher funds development or distributes on behalf of the independent (both of which are rare on smartphone where most developers self-finance).

Commercial performance
Typical gross revenue range: $50,000-$150,000 (Java); $0-$150,000 (Smartphone).
Typical audience sizes: 10,000-200,000 free and premium downloads.

Development resources
The resources need to develop Java and smartphone games are similar if much shorter in basic function to those required for console development. Average team size is 3-5 staff, but team sizes can range up to 20 for major publisher titles. Functions in italics are only used by some developers.

Function	Skills	Responsibility	Number of staff	Technology requirements
Design				
The formulation of a game's gameplay structure, goals and tutorials as well as the environmental layout and story. Games designs guide all other development roles	Creative, communication, project management, usually art or programming background, level design	Designer or programmer	1 part / full time	None
Programming				
The creation of technologies that make the game run; includes rendering, physics simulation, animation as well as user interfaces	Programming, tool development, music / audio integration	Programmer	1-2 full-time	1st and 3rd party tools and middleware
Graphics				
The creation of the art and animation assets that make up the majority of a game's content.	Art and graphic design, use of art/animation tools	Artist	1-2 full-time	3rd party art tools
Production management				
Producers ensure development projects adhere to budgets, schedules and quality expectations	Project management, leadership	Producer	1 part / full time	3rd party pipeline management tools (rarely)
Music and audio				
The music and sound effects that make up the rest of the game's content but are usually outsourced/licensed	None	None	Negligible internal but external resources	3rd party audio tools

Function	Skills	Responsibility	Number of staff	Technology requirements
form external sources				
QA				
Modest testing to identify technical and compatibility bugs	As per function	All team members	10-20% of total build time	As per function
Customer / community support				
Customer support is a negligible function on mobile and community management is only relevant for multiplayer games	*Communication*	*All team members*	*Negligible / 1-2 part/full time*	*None*
Localisation				
The translation of a game into different languages, usually handled by third parties	*Programming*	*Programming*	*1 part time*	*None*
Network				
Integration of network features such as leaderboards, achievements, multiplayer gameplay modes and new content	*Network engineering, programming*	*Network engineer*	*1 part time + external resources*	*3rd party network platform*
Analytics				
The measurement of customer usage is a requirement only for some microtransaction games on smartphone	*As per function*	*Most / all team members*	*Negligible*	*3rd party analytics package*

The development process

Java games undergo a scaled-down version of console's standard milestone development (see console section for more detail) whereupon the publisher will pay for a third party to port the game to hundreds of handsets. These versions are then tested quickly by operators before release onto portals. Smartphone development is very similar, excluding porting, with cursory testing by handset manufacturers before release onto app stores. Microtransaction and some other (often multiplayer) games can evolve significantly after launch, which means continuous production in repeated short cycles.

Development costs

Java: $25,000-$75,000 on development, $25,000-$75,000 on porting (depending on desired reach).
Smartphone: $15,000-$150,000 on development, with some games with ongoing content requirements requiring an additional 5%-25%/annum.

Publishing resources

Publishers only play a significant role for java games:

Development finance: The vast majority of mobile development is funded by publishers, which is typically overseen on a day-to-day basis by a producer.
Porting: Publishers commission third parties to customise games for hundreds of handsets.
Marketing: Publishers typically pay operators for placement and more rarely will conduct classic marketing campaigns and PR, but costs very rarely exceed $100,000, and then only for major titles.
Distribution: Publishers, sometimes via staff in different territories, handle operator relationships ensuring good placement in operator's mobile portals in multiple territories, sometimes using third party distributors who supply smaller web portals.

3.1.3 Casual online games

B2C revenue models employed

The following B2C models are employed in this sub-sector:

- **Advertising**: Advertising is the key revenue stream for browser-based casual online games services, most of which are offered for free. It usually takes the form of banner advertising on the games site and is typically sold using the standard per 1000 impressions (CPM) model that delivers from $1-$15 CPM.
- **Network retail:** An important part of this sub-sector is the sale of downloadable casual games. These games are offered on a try before you buy basis with the first hour of gameplay free and the full game unlocked for $7-$20.
- **Subscriptions**: Commonly provided as an alternative to network retail, subscriptions offer users access to free and discounted downloadable titles. A small number of services provide premium browser gaming services via subscription too. Subscriptions vary from $3-$10/month.
- **Microtransactions:** Some browser games services use microtransactions letting players buy avatar items, game time and wagered skill game tournament entry using a premium virtual currency.

B2B revenue models employed

- **Advertising:** As per the console section above.
- **Affiliate & white label distribution:** A number of portals and specialist publisher/distributors provide fully managed network retail and subscription services through third party sites for which they charge 25%-70% of gross sales.
- **Development finance:** Most casual browser games are self-funded although third party commissioned casual browser games are common and used primarily as promotional tools for third party brands. Some download games publishers commission third party developers to create specific titles (mainly sequels and licenses) although self-funded download games are more common.

Commercial performance

Typical gross revenue range: $10,000-$100,000 (browser game); $0.2m-$0.75m (download game)
Typical audience sizes: 1m-10m sessions (browser game); 0.5m-2m free downloads (download game)

Development resources

The resources need to develop casual online games are similar to those required for mobile games development. Average team size for browser games is 1-5 staff and for download games is 5-10. We

have assumed a 5-man browser game developer for the table below. Functions in italics are only used by some developers.

Function	Skills	Responsibility	Number of staff	Technology requirements
Design				
The formulation of a game's gameplay structure, goals and tutorials as well as the environmental layout. Games designs guide all other development roles	Creative, communication, project management, usually art or programming background, level design, analytics	Designer (or programmer / artist)	1 part time	None
Programming				
The creation of technologies that make the game run; includes the games engine, animation and gameplay as well as user interfaces (i.e. control methods)	Programming, tool development, mathematics, physics, music / audio integration	Programmer	1-2 full time	1st and 3rd party tools and middleware
Network engineers				
Integration of network features, interoperability with portals' systems	Programming, network	Programmer	1 part time	1st and 3rd party tools and middleware
Graphics				
The creation of the art and animation assets that make up the majority of a game's content.	Art and graphic design, use of art/animation tools	Artist	1-2 full and part time	3rd party art tools, 1st and 3rd party animation tools and engines
Music and audio				
The music and sound effects that make up the rest of the game's content is often sourced/licensed externally	None	None	negligible	3rd party audio tools
QA				
Done internally to optimise performance and identify technical and compatibility bugs	As per function	All team members	negligible	None
Marketing / commercial management				
Affiliate distribution & marketing via third parties	Marketing, finance, commercial, analysis	Managing director	1 part time	None

Function	Skills	Responsibility	Number of staff	Technology requirements
Production management				
Producers ensure development projects adhere to budgets, schedules, quality and commercial expectations	Project management, leadership	Managing director	1 part time	3rd party pipeline management tools
Senior management and admin				
Overall studio management	Leadership, project management communication, finance, HR	Managing director	1 part time	None

The development process

Browser-based casual online games typically have short-duration but often rather unstructured development processes with little by way of formal planning and all team members multi-tasking. Downloadable casual games have longer and more disciplined development processes. Both tend to produce games that may be tweaked post-launch but are only very rarely expanded so have very limited ongoing development.

Development costs

Typical development costs (to launch) for casual online games are:

Browser games: $5,000-$25,000

Download games: $50,000-$200,000

Portal/publishing resources

Portals and other casual online games distributors require the following:
Marketing: Advertising expenditure is almost always online and often viral-based
Distribution: MMOGs are usually distributed directly to consumers via dedicated web sites hosted by the portal/publisher often using third party infrastructure services which charge based on resources (rack space, bandwidth) used.
Billing: Billing for premium services is done via third party payment service providers.
Customer support: Customer support is provided almost exclusively for premium services and even then is often very limited. It is conducted by internal and external resources.
Community management: Community features are increasingly common necessitating community management roles although this is rarely more than 1-2 staff even for the biggest services.

3.1.4 MMOGs and virtual worlds

B2C revenue models employed

The following B2C models are employed in this sub-sector:

- **Physical and network retail:** A tiny proportion of MMOGs are accessible via boxed or network retailed products, sold in the same way as described in the console section earlier.

- **Microtransactions:** MMOG publishers sell packs of premium virtual currency that can cost from around $5 to $100 (or more). This currency is then redeemed by the player for virtual items such as swords and virtual services such as short-term character upgrades. Since there is no material cost of sale for each purchase, microtransaction sales tend to be very high margin.
- **Subscriptions**: MMOG publishers charge a fixed fee per month to access a game or, with freemium titles, the premium content in a game. The fee is usually collected monthly via an automatic rebilling process but some publishers offer discounts for pre-purchasing multiple months' subscriptions. Prices vary primarily based on the target audience with young teen and tween-oriented titles charging $4-$8/month and adult titles charging $10-$15/month.
- **Advertising**: Advertising revenue for MMOGs is usually sought by freemium games publishers who aim to monetise the free players. Again, it is usually supplemental only and rarely more than 10% of freemium games' revenues. It usually takes the form of banner advertising on the games site and is typically sold using the standard per 1000 impressions (CPM) model that delivers from $1-$15 CPM.

B2B revenue models employed

- **Physical and network retail, and advertising**: As per the console sections earlier.
- **Development funding:** The vast majority of MMOGs are self-funded by independent developers or publisher studios.
- **Marketing and distribution:** In addition to standard advertising, some MMOG publishers use affiliate partnership strategies to acquire users from existing communities such as games web sites paying either a fixed bounty per user acquired from these affiliates or 10%-40% of their lifetime revenue.
- **Licensing:** MMOG licensing is very common and typically based on 3-5 year exclusive geographic exploitation rights so the same game can have three or more publishers globally. Licensing is always done on a revenue share basis (typically 20%-50% of net receipts).

Commercial performance

Typical gross revenue range: $0.05m-$2m/month (browser MMOG); $0.2m-$4m/month (client MMOG).
Typical audience sizes: 0.25m-10m free and paying players/month (browser MMOG); 0.1m-1m free and paying players/month (client MMOG).

Development resources

MMOG development requires the broadest selection of resources of any game type although the core resources remain the same as those found with console games development. Average teams sizes for browser and client MMOGs vary widely with the former typically comprising 15-25 staff and the latter 50-150 staff. For the table below we have assumed a browser MMOG team of 25 staff.

Function	Skills	Responsibility	Number of staff	Technology requirements
Design				
The formulation of a game's gameplay structure, goals and tutorials as well as the environmental layout. Games designs guide all other development roles	Creative, communication, project management, usually art or programming background, level design, analytics	Designer	1-3 full time	None
Programming				
The creation of technologies that make the game run; includes the games engine, animation and gameplay as well as user interfaces (i.e. control methods)	Programming, tool development, mathematics, physics, music / audio integration	Programmer	2-4 full time	1st and 3rd party tools and middleware
Network engineers				
Creation and maintenance of network technologies (multiplayer interaction, databases and servers)	Programming, network	Programmer	1-3 full time	1st and 3rd party tools and middleware
Graphics				
The creation of the art and animation assets that make up the majority of a game's content.	Art and graphic design, use of art/animation tools	Artist	8-12 full time	3rd party art tools, 1st and 3rd party animation tools and engines
Music and audio				
The music and sound effects that make up the rest of the game's content, sometimes soured/licensed externally	Sound and music design	Sound designer, musician	1-2 full and part-time	3rd party audio tools
QA				
Consumer focus testing of gameplay is performed continuously, with much live testing, to optimise performance and identify technical and compatibility bugs	As per function	All team members	2-4 part time and an increasing % of total build time	None
Analytics				
Continuous	Data mining, finance,	Analyst + all	1 full time	3rd party

Function	Skills	Responsibility	Number of staff	Technology requirements
measurement of customer usage via quantitative and qualitative methods	analysis, commercial	team members		analytics package
Marketing / commercial management				
Affiliate distribution & marketing via third parties, overseas licensing	Marketing, finance, commercial, analysis	Commercial director or CEO	1-2 full time	3rd party analytics package
Customer / community support				
Customer support is a minor function on social games. Community management is only relevant for larger games	Communication, language skills	Customer support staff, community manager	2-6 part / full time + external resources	None
Localisation				
Translation is handled by third parties	Language skills, programming	Programmer	1 part time staff member +external resources	None
Production management				
Producers ensure development projects adhere to budgets, schedules, quality and commercial expectations	Project management, leadership	Producer	1 full time	3rd party pipeline management tools
Senior management and admin				
Overall studio management including resource allocation, HR and finance	Leadership, project management communication, finance, HR	Admin	1-3 full time	None

The development process

The process of getting an MMOG to launch is largely the same as that for console games but with QA (primarily beta testing) playing a more important role. In addition the development process can be significantly longer as developers not only build a more complicated title compared to console games but also one that requires significantly greater content prior to and post launch to keep players playing and paying.

Development costs

Typical development costs (to launch) for MMOGs can be split into two key categories:

Client-based MMOGs: $5m-$100m.

Browser-based MMOGs: $0.25m-$1.5m.

For both categories, annual ongoing development costs typically vary from around 5% of initial development costs to 50%.

Publishing resources

MMOG publishers' major roles and cost line items differ from that for console games in the following ways:
Marketing: Advertising expenditure is almost always online and so, even for the larger MMOG publishers, rarely exceeds around 10% of revenues (excluding affiliate deals, see B2B models above).
Distribution: MMOGs are usually distributed directly to consumers via dedicated web sites hosted by the developers themselves often using third party infrastructure services such as TeliaSonera and Amazon which charge based on resources used (e.g. rack space, bandwidth, processing power and time).
Billing: Billing comprises third party payment services such as credit card processing, verification and payment collection and technologies such as microtransaction systems and in-game market places for which fees of 5%-50% are charged.
Customer support: Customer support is a crucial component to the MMOG business model and supplements that provided by developers. External customer support is commonly used for foreign language versions of the games and for more popular titles.
Community management: Also done in conjunction with the developer's community manager but requiring less staff and is typically only outsourced for foreign language communities.

3.1.5 Social network games

B2C revenue models employed
The following B2C models are employed in this sub-sector. Hereafter, social games means games on social networks (SNs) with Facebook (as market leader) taken as standard (other SNs may vary):

- **Microtransactions:** Microtransactions in social games involve users acquiring a premium virtual currency (e.g. Facebook Credits) from the SN which is then redeemed either directly for virtual goods and services within a game or for another (game or publisher-specific) virtual currency which is then used to buy virtual goods and services. All currencies are typically sold in packs from around $5-$200.
- **Advertising**: There are typically two kinds of advertising on social networks, that which runs in the page frame around games and that which runs inside or around games. Advertising is an ancillary revenue stream for all titles.
- **Offers**: This is a hybrid between advertising and microtransactions, where players reluctant or unable to pay gain virtual currency in return for participation in surveys and advertising offers.

B2B revenue models employed
SNs typically retain 30% of all purchases of their virtual currency s and offers revenue in return for operating the SN and its payment system. SNs take 100% of page frame advertising. Games developers, who almost universally self-finance development and publishing, take the remainder, plus any in-app advertising revenues.

Commercial performance
Typical gross revenue range: $5,000-$50,000 per month.
Typical audience sizes: 50,000-500,000 monthly active users.

Development and operational resources

The resources need to develop social games have some similarities in basic function to those required for console development but add significant differences, primarily the use of analytics and continuous, iterative production. Average team size is 12-15 staff, but team sizes can range up to 50 for major titles. Functions in italics are only used by some developers.

Function	Skills	Responsibility	Number of staff	Technology requirements
Design				
The formulation of a game's gameplay structure, goals and tutorials as well as the environmental layout. Games designs guide all other development roles	Creative, communication, project management, usually art or programming background, level design, analytics	Designer	2 full time	None
Programming				
The creation of technologies that make the game run; includes the games engine, animation and gameplay as well as user interfaces (i.e. control methods)	Programming (Flash), tool development, music / audio integration	Programmer	2 full-time	1st and 3rd party tools and middleware (Flash)
Network engineers				
Integration of game into the SN's social graph, plus features such as achievements, new content updates and serving	Programming, network	Programmer	1 part time	3rd party network platform
Graphics				
The creation of the art and animation assets that make up the majority of a game's content.	Art and graphic design, use of art/animation tools	Artist	4 full-time	3rd party art tools
Production management				
Producers ensure development projects adhere to budgets, schedules, quality and commercial expectations	Project management, leadership	Producer	1 full-time	3rd party pipeline management tools (rarely)
Music and audio				
The music and sound effects that make up the rest of the game's	None	None	Negligible	3rd party audio tools

Function	Skills	Responsibility	Number of staff	Technology requirements
content but are often outsourced/licensed				
QA				
Consumer focus testing of gameplay is performed continuously, with much live testing, to optimise performance and identify technical and compatibility bugs	As per function	All team members	Increasing % of total build time	As per function
Analytics				
Continuous measurement of customer usage via quantitative and qualitative methods	Data mining, finance, analysis, commercial	Analyst + all team members	1 full-time	3rd party analytics package
Marketing / commercial management				
Distribution and marketing of a social game on SNs	Marketing, finance, commercial, analysis	Commercial director or CEO	1 part time	3rd party analytics package
Customer / community support				
Customer support is a minor function on social games. Community management is only relevant for larger games	Communication, language skills	Community manager	1 part / full time	None
Localisation				
Translation is handled by third parties	*Programming*	*Programming*	*1 part time*	*None*
Senior management and admin				
Overall studio management including resource allocation, HR and finance	Leadership, project management communication, finance, HR	Admin	2-3 full time	None

The development process

Social games are developed via milestones like console titles until live beta, when all features of a game are tested in front of users and then optimised using analytics. Between 30-50% of a game is developed pre-launch and the remainder after launch, with all post-launch features guided by performance. Social games are typically in continuous production until the developer decides that financial performance has peaked or declined beyond an acceptable threshold.

Development costs

$150,000-$200,000 on development to live beta, then ongoing $150,000-$300,000 per annum.

Publishing resources

Third party publishing is very rare for social network games as the barriers to self-publishing are so low. Where independent developers have used third party publishers they have done so primarily to gain access to the publishers' existing user base and many of the publishing functions have still been undertaken by the developer.

3.1.6 Services

A wide range of service companies supply the games industry. Each fits into a different part of the different value chains for each sub-sector. Here we will profile the leading types of service company.

Advertising: Advertising networks such as Google or Ad Mob are used by games companies to sell inventory and sponsorship in web pages, games and applications. They attract advertising from agency buyers and serve the advertising into clients' pages, taking between 30-40% of gross revenues. Some online games advertising companies (such as Mochi and Wild Tangent) aggregate free games from developers and millions of gamers. Others operate sophisticated advertising auction and exchange services, primarily for social games.

Analytics: Analytics solutions designed for social and mobile games and MMOGs deliver user behaviour analysis by mining data from clients' games. Analytics companies' solutions can cost from $0-$5,000 per month.

Art and animation: Outsourced (and insourced) art and animation companies are designed to bolt onto permanent teams (usually of console, PC, handheld games and MMOG projects) and deliver mostly lower (but sometimes high) value art and, more rarely, animation to highly specific guidelines. Contracts are based on renting capacity from providers for between $1,000-$7,500 per man-month, the cost of which is highly dependent upon quality and location.

Audio and music: The provision of sound effects, voice acting and music assets from stock and bespoke recording, which can require small teams to entire orchestras. Many providers specialise in delivering assets designed for console technology. Prices vary widely from $500 for stock sounds to over $50,000 for new compositions and orchestral recordings.

Billing and payment solutions: The provision of billing, fulfilment and other payment solutions, such as virtual wallets, aggregation of payment mechanisms which vary significantly by territory, white or branded label virtual currencies and virtual goods stores, and virtual and real currency exchanges to MMOGs, virtual worlds, online and social games companies. Such services typically cost between 3%-30% of the transaction value but can go higher for certain high cost transaction types and for complete managed services. Examples include PlaySpan (billing and payment fulfilment solutions), Live Gamer (billing and virtual exchange solutions), Global Collect (payment fulfilment), PayPal (payment fulfilment) and Incomm (pre-paid retail games cards)

Design and script: The provision of outsourced games design and narrative services (usually for console, PC, handheld games and MMOG projects), usually on a short-term basis by renting capacity for between $5,000-$10,000 per man-month.

Manufacturing: The manufacturing process for PC games is relatively simple with disc replicators, box and insert (manuals etc.) manufacturers charging a fixed fee per unit made. This is typically no more than $3. For console and handheld games it is more complicated with licensing agreements necessitating new games are manufactured either by their own facilities or accredited third parties. The console manufacturers use this to levy a fee for use of their console technology and access to their user bases. This fee varies from manufacturer to manufacturer but typically is tiered, based on

the intended wholesale price of the game and so ranges from around $4 to around $12 per unit manufactured.

Marketing, PR and design: The provision of services to sales and marketing teams of publishers of console, PC, handheld games and retail MMOGs, which include traditional marketing campaigns, PR and advertising and web design. These services are provided on a work for hire basis and can cost between $10,000-$500,000.

Motion capture: The provision of animation based on real world movement captured by camera and converted into data for use in-game, which requires multiple cameras, data-conversion rigs and body, facial, and traditional actors to replicate the desired actions in a studio. These services are provided on a work for hire basis and can cost between $40,000-$150,000.

Network distribution: The provision of game syndication or simply user traffic to clients via sites or affiliate networks of sites with high usage volumes. These services operate on a free (recouped via advertising), fee-based ($5,000-$80,000 per game), cost-per acquisition bounty ($1-$20 per user) or revenue share (10%-40% of the lifetime value of a customer) basis. Network distribution also includes serving infrastructure (see later)

Offers: Companies that intermediate between advertisers paying bounties for lead-generation, and operators of social games using microtransactions, which pay out small amounts of virtual currency in return for participation in surveys and advertising offers. Offers companies typically take 10-30% of the bounty paid by the advertiser for a solid lead.

Physical distribution: Although most of the larger console games publishers have their own distribution networks, they still make use of third party distributors for other territories and for the mass of small independent retailers. Smaller publishers have little or no distribution of their own so will rely on third parties. Distribution roles can therefore vary from simple 'pick, pack and ship' goods conveyance to distributors managing sales to retailers. Distribution costs can therefore range from around $1 per unit to around 15% ($4-$6 at the upper end) per unit.

Porting: Porting companies, often located in low cost territories, will take base handset versions of a Java game and optimise them for the hundreds of handsets required by operators before a game is accepted for distribution on their networks. Prices range from around $50,000-$75,000 for an international release.

Programming: This function is usually delivered by permanent or contract staff within studios but on rare occasions is delivered by specialist programming companies who are rented on a short-term basis for between $5,000-$10,000 per man-month.

QA and testing: Service companies in this category provide two kinds of services. One is technical, bug and compatibility testing of games by low level, often contractor staff who look for errors during production and post-production. Charges are based on volume of game and usually range between $30,000-$60,000 per title. The other service is focus group testing, which can be outsourced to specialist companies who use technology to track hand and eye movement, as well as qualitative survey-based analysis, to test consumer reactions to games at various stages of development. Charges typically range from $7,000-$15,000 per group.

Localisation: Localisation of console, handheld and PC game text and audio is accomplished by teams of contractors, again often in lower cost or subsidised territories, who translate and check for culturally-sensitive content, into typically 4-10 languages. Charges are based on number of words to translate and number of languages, and usually range between $40,000-$90,000 per title.

Serving infrastructure: Most games companies need hosting and data serving services, and many providers are moving into the cloud in particular for web gaming solutions. Charges are commoditised but vary very widely and are on a usage basis, typically featuring ongoing or total bandwidth caps. Amazon, for example, offer a large range of charging options for its EC2 cloud service based around

per hour charges, per annum and metered data transfer rates which result in typical costs from free to $100,000 or more per month. For more bespoke and server-intensive infrastructure needs such as those for client MMOGs, co-location is a common solution. MMOG publishers need to provide players with low latency connections which invariably means locating servers as geographically close to their major player bases as possible. Connectivity is extremely good within Europe so servers can (and are) located in several locations, mainly at or (topologically) near the key inter-connection points (London, Amsterdam and Frankfurt within Europe). Bandwidth and hosting is a highly competitive and commoditised business that is dominated by international Tier 1 telecoms companies such as Level 3 and TeliaSonera.

Support and community management: The provision of white label support services including some QA, localised account and community management, technical, anti-hacking and billing support services for network games of several kinds. Costs vary widely depending on depth of service required and are typically charged for on a per man-month basis.

Tools and middleware: This broadest of service categories includes software designed to assist studios and games companies during games' development and distribution. Each uses different models (from licence fees to revenue share to consultancy) and performs radically different tasks for the client. This category includes:

- Analytics
- Animation
- Anti-hacking/cheating
- Asset management
- Art
- Artificial intelligence
- Billing
- Audio
- Compilation
- CRM
- Database
- Development/pipeline management
- DRM/copyright protection
- DTP
- Facial scanning hardware/software
- Complete game engines
- Image/video/audio compression
- Lip synching
- Modelling
- Mobile social
- Motion capture hardware/software
- Network
- Music
- Physics simulation
- Pre-visualisation
- Prototyping
- Rendering
- Shader tools
- Speech recognition
- Testing / bug-tracking
- Texturing tools
- Translation

- UI creation
- Video editing
- Voice communications
- Web design tools

3.2 Games development locations and the support they provide

Introduction

This report section looks at game development and operation locations and the resources they provide to companies looking to locate operations there, including a brief overview of 9 international locations (Quebec, San Francisco, Seattle, Hamburg, Shanghai, London, Singapore, Seoul and Paris), including their estimated scale (development headcount), growth potential, major local companies, and critical assessment of strengths and weaknesses in game development and operation. This section will not profile all the largest clusters to avoid duplication. Instead the locations profiled have been chosen to provide a spectrum of clusters with different characteristics as they relate to companies' location decisions. A deeper analysis of some of these characteristics will be offered in Chapter 3.3. For a more complete list of major and minor games development and operation locations, see Chapter 2.4. Unless otherwise indicated, all data is sourced by GIC from public sources, GIC's proprietary databases and estimates. For more detailed information on some of these clusters, especially their financial support, see GIC's 2007 report *Playing for Keeps*[49].

Definitions

Tax Credit: Tax credits take many different forms but are usually an additional deduction against taxable profits or losses calculated against a range of specified eligible expenditure, the definitions of which can be total development costs, project development costs, total salary costs, salary costs for residents within a territory, research and development costs and so on. See Finance section for more detail.

JEREMIE: A European initiative which allows countries to utilise part of their Structural funds to finance small to medium-sized enterprises via loans, guarantees, insurance, securitisation, venture capital and other equity instruments. Funds pass through a revolving Holding Fund managed by the European Investment Fund.

Loan Guarantee: Loan guarantee schemes often with multiple components are run in many countries. One is the EFG, run in the UK by the Department for Innovation and Skills targeting small businesses which lack the security to win bank loans as working capital. The scheme guarantees up to 75% of the value of the loan. Quebec runs the Strategic Support for Investment Program (PASI), which guarantees 70% of the value of the loan.

Enterprise Investment Scheme: A UK investment incentive offering tax credits worth 20% of an individual investor's purchase of shares in a qualifying new company. This has recently had the valuable capital gains tax relief component removed.

Incubation: Incubators typically provide low-rent office space, subsidised or free infrastructure and technology, networking and business advice services to start-ups.

3.2.1 Quebec

Estimated scale: c. 7,500 staff work in development roles in the cluster, in 80-90 companies. Quebec is Canada's largest games cluster.

Major local companies: Quebec is home to the world's largest studio, Ubisoft Montreal, as well other publisher studios such as 2 EA studios, Gameloft, Square Enix, Activision (Beenox), THQ and Warner. It houses independents like Behaviour Interactive (formerly A2M), Frima Humagade and Sarbakan; and service companies like Enzyme Labs, Babel, Bug Tracker, Alchemic Dream and tools developer Autodesk.

[49] http://www.gamesinvestor.com/content/research/Industry-Reports/Playing-for-keeps-%282007%29/

History: Quebec was a multimedia hub in the mid-1990s with good universities and relatively low employment costs. Seeing the success of Vancouver in organically growing a video games sector offshored by Californian companies, politicians explicitly targeted games as Quebec's next growth area. With fairly high degrees of legislative and fiscal control, the province was able to assign large sums for bilateral deals with large companies and for a wide range of tax credits, subsidies and other fiscal schemes (estimated to be worth between €180-200m in 2011). In total, Quebec is estimated to have spent over €750m since 2000 building its games sector, triggering over €1.5bn worth of gross investment by games companies.
Growth potential: Strong. Quebec's games sector has exhibited c. 17% headcount CAGR between 2006 and 2011, driven largely by global publishers whose continued investment appears guaranteed according to their press releases and the likely continuation of tax credits and other fiscal measures.
Local support: Strong. Quebec has the most comprehensive selection of governmental support of all clusters worldwide, offering a 30%-37.5% tax credit on all developers' salaries[50], bilateral assistance for large companies, income tax holidays for immigrants that taper from 100% to 25% over 5 years, grants to import foreign specialists, and a wide range of other funds. The local agency InvestQuebec offers comprehensive support services.
Strengths: Quebec is the first choice location for any global publisher wanting to build a new console or mobile development studio and its fiscal support is perceived by the industry as second to none. Its talent pool is very strong across multiple genres of console title. Its labour costs, before subsidies, are low versus major US clusters, while its university and experienced talent pool is impressive. Ubisoft trains the best university graduates on a games campus co-funded by the government. Access to capital is quite strong (via a range of private equity and venture capital firms offering investment and loans, some of which are backed by government guarantee schemes), its geographic and cultural proximity to North America is useful and accessing government support is efficient and streamlined.
Weaknesses: Quebec's independent sector still has a relatively weak track record of originating new games IP and this activity (as opposed to work for hire on global publisher's IP) is not incentivised by fiscal measures. Labour mobility is very high, and a lot of senior staff move between companies, or return to their country of origin, which generates a lot of recruitment activity inside and outside of the territory. Ownership of IP by Canadian companies is minimal, with no major Quebecois publishers to speak of. PC games development takes a fairly distant second place to console and mobile, which means that there are few leading Quebecois online or social network games companies. Finally, publisher's spending power means that the average quality of talent in independents is lower than that in publisher studios.

3.2.2 San Francisco

Estimated scale: c.8,000 staff work in development roles in the Bay Area, in around 200 companies. **Major local companies:** San Francisco is home to Zynga, Foundation 9, Digital Chocolate, Playdom, Kabam, RockYou and ngmoco, amongst many others. It houses a number of large publisher studios such as EA Maxis, EA Redwood Shores, Sega, Square Enix, Disney Playdom, EA Playfish, Activision's Sledgehammer and LucasArts.
History: San Francisco and the corridor running from the Bay Area to San Jose in Silicon Valley has been home to the games industry since its birth in the early 1970s. One of the first games companies, Atari, was founded in the heart of the electronics and semiconductor industry here, which was followed by generations of games companies since then. They have taken advantage of the trained talent pool from hardware, software and then internet companies, as well as recruiting heavily from the world class local universities (particularly Stanford). San Francisco experiences a higher start-up rate than any other games cluster due to the talent pool, risk-friendly finance sources and

[50] The additional 7.5% is for Francophone companies.

entrepreneurial culture. New companies raise seed and venture capital from the highly concentrated cluster of high risk investment companies that are themselves often founded, run or advised by entrepreneurs. As the centre of the global internet industry, and in particular the social network industry, San Francisco houses some of the world's largest online games companies.

Growth potential: Strong. While formal statistics are not available, since 2008 San Francisco has become the home of social network gaming, with at least 25% of its development headcount now working in social network games companies. The cluster's games studios have experienced significant growth in recent years (over 50% between 2008 and 2010) as a result, and the cluster is set for more growth as the next generation of cross-over games companies are founded and raise capital. Some recent games examples are Funzio that raised $20m from IDG, Kabam that raised $115m (over two rounds in 2011) and Foursquare that raised $50m, both from a variety of firms.

Local support: Minimal. While Silicon Valley has its roots in military R&D and the Californian state legislature has recently passed a film tax credit, San Francisco has no formal programmes from state or federal government targeting games. Finance, primarily in the form of private or trade (i.e. from other games companies) capital, is readily available. Zynga is reportedly negotiating with the city of San Francisco over freezing its salary taxes (Twitter won such a deal recently) but, beyond the odd bilateral deal, the city does not (nor need to) offer incentives.

Strengths: This cluster is strong in games software development across the board, with market leaders in all sub-sectors and platforms of the offline and online games industry. Indigenous and global publishers are based here. The social network games industry was founded here, co-located with Facebook. Original IP development on all platforms is very strong indeed.

Weaknesses: This area dominated the console games hardware industry for around a decade in the 70s and early 80s but no longer plays a role.

3.2.3 Seattle

Estimated scale: c.2,000 staff work in development roles in the cluster, in around 60 companies.

Major local companies: Seattle (and its environs) is home to console manufacturer Microsoft and the sales operation of Nintendo of America. It also houses publisher studios such as Microsoft Games Studios and Monolith (Warner), and large independents like Valve, Big Fish Games, Foundation 9, Bungie and PopCap. One of the leading games development universities, DigiPen, is located in Redmond.

History: Three centres of games development have sprung up over the years, with much of the activity centred around Microsoft. The Bellevue Kirkland cluster began in the early 1990s but grew rapidly when ex-Microsoft employees started Valve in the mid-1990s. Around the same time, downtown Seattle had become the focus of more internet start-ups, such as RealNetworks, and alumni from RealNetworks started up Big Fish Games, a leading casual online games company. Redmond became the focus of a resurgent US console manufacturing industry in the late 1990s before the launch of the Xbox.

Growth potential: Modest. Microsoft and Warner have made minor cuts to their studio staff in recent years, although Microsoft is staffing up for the next Xbox, estimated to be due in 2013-2015. As a whole, the cluster is not experiencing strong growth, but is unlikely to decline substantially.

Local support: Modest. No games-targeted support is available in Washington State, but the State does have low corporation tax and, unlike most states, no personal income taxes. Generic R&D tax credits up to $2m are available. While there are some venture capital companies based here, much of the cluster's growth has been organic and via trade financing.

Strengths: The Seattle cluster is strongly biased towards console development and AAA titles, and original IP development on these platforms is very strong. The cluster's proximity to Microsoft has been the primary driver of growth and start-ups, while good universities have also boosted growth.

Weaknesses: While Seattle has a handful of important network games companies, the start-up rate has been relatively low recently and the number of social network games companies located here is low.

3.2.4 Hamburg

Estimated scale: c.1,500 staff work in development roles in the cluster, in 60-70 companies.
Major local companies: Hamburg is home to many of Germany's largest games companies such as Bigpoint, Innogames, Gamigo and dtp Entertainment. Germany's strong PC and online games focus has ensured that many companies are self-publishing developers. Square Enix and dtp Entertainment are more traditional boxed product publishers located here.
History: The cluster is Germany's oldest and was begun in the mid-1990s with the formation of PC adventure games publisher, dtp entertainment. The cluster started to grow strongly in the mid-2000s with the surge in growth at Bigpoint. The cluster has benefitted from mild support from local government (via a public/private promotional and assistance body Gamecity:Hamburg) since 2006.
Growth potential: Good. Hamburg's games cluster has been growing by 10-15% per annum from around 500 in 2004 (faster than most other European locations), and the cluster's focus on hardcore PC and MMOGs should result in more growth, perhaps at a lesser rate than the past 5 years. The cluster's promoters say there are more than 500 open positions in games companies (but that includes a wider value chain of non-games support companies).
Local support: Modest. While there is little direct fiscal support, Gamecity (a trade body funded by the Hamburg State Ministry of Culture, Sports and Media) assists with networking, workshops, trade show attendance, discounted office space, start-up consulting, and prototype funding (<€100,000). It also assists the local university by funding a games degree.
Strengths: Hamburg is Germany's largest games cluster, and it represents Germany's core strengths of hard-core online and offline PC games development. German companies' focus on PC has helped them to retain IP ownership, and develop core technology to support the maintenance of live games services for millions of players. The city's location in the heart of Europe have seen several online games companies specialise in multi-language service provision, and German online games companies are dominant online in many European territories as a result. Finally, its universities have traditionally been strong in engineering and more recently in training software developers.
Weaknesses: Germany, and subsequently Hamburg, has not developed a substantial console sector (with the exception of 2-3 studios outside Hamburg), and the country has struggled to create studios whose products succeed in North America. Hamburg has also not produced any major companies in the mobile or social network space to date.

3.2.5 Shanghai

Estimated scale: Between 11,000-12,000 work in development roles in the cluster, in around 200 companies.
Major local companies: Shanghai is home to numerous major online games publishers such as Shanda, Netease, Giant, 9You and The9. Ubisoft, Activision, Square Enix, Disney, EA Playfish have studios located there making parts of games as well as, more rarely, independents like Epic, PopCap and CCP. Shanghai has a significant outsourced services sector led by Virtuos.
History: Shanghai's games industry was started by Japanese and French publishers opening outsourcing operations in the mid-1990s. Ubisoft's had the most impact, with an in-sourced art and animation studio opened in 1996 and raw graduates trained using experienced western staff. Its alumni now top many Chinese games companies. Until the early 2000s, outsourcing was the dominant source of revenues for the handful of Chinese games companies, but China's growing domestic online games industry has powered significant growth since then. For many years, the

market was dominated by Korean product, but after wide scale copying, Chinese online games started to be developed in China, and Shanghai is now the centre of China's games industry.

Growth potential: Shanghai has experienced substantial growth over the last decade, and is estimated to have doubled in size between 2007 and 2011. As China's domestic games industry has significant further growth potential, Shanghai's games development cluster seems unlikely to slow in the near term.

Local support: Modest. Shanghai's local government has offered little in the way of support for games companies beyond subsidised rents in an office block which has incubated a number of games companies and a tax regime that supports local R&D. Shanghai is home to the China's largest stock exchange and investment community, which has helped local companies raise finance. Arguably the biggest state benefit for Chinese games companies is the insurmountable trade barrier to oversees companies operating their own games in China as it minimises foreign competition and necessitates local partnerships for those overseas companies that do persevere.

Strengths: Shanghai's developers power China's domestic and increasingly non-Japanese Asia's online games market, which has been dominated by MMOGs until recently, when social network games began to be popular. The city's developers can build and launch (sometimes from scratch, at other times by copying) online games very rapidly, and the games tend to be commercially aggressive. It is the first port of call for global publishers wanting to set up lower cost art, animation and (more recently) programming divisions in China.

Weaknesses: Genuinely original IP development is not strong in China as a whole, and, excluding mobile, non-PC games such as a consoles are only made here by international companies. Talent poaching is rife and companies often struggle to keep staff. IP protection is very weak, copying is commonplace (including by the largest companies) and authorities have been accused of taking a deliberately soft approach on copyright to encourage the development of an indigenous software development sector. Efficiency levels are thought to be sub-optimal in many large studios and politicians have frequently targeted foreign games (notably World of Warcraft) with service denials on spurious grounds. Finally, there are almost no examples of Chinese games that have sold well in the west, but the strength of its domestic market makes this increasingly a moot point.

3.2.6 London

Estimated scale: c.1,500 staff work in development roles in the cluster, in 140 companies.

Major local companies: London is home to publisher head offices for Sony, Warner, Disney, Konami, Namco, Sega and Square Enix. Publisher studios include SCEE London Studios, Sport Interactive (Sega), Playfish (EA), Rocksteady (Warner) and Beautiful Game Studios (Square Enix). It houses independents like Splash Damage, Slightly Mad, Mind Candy and Miniclip.

History: Unusually for British media, London does not house the vast majority of the British games industry which is spread around multiple clusters in the UK, although it is the largest cluster by headcount and number of companies. Since the late 1980s, the UK has been the European headquarters of choice for many global publishers, and London and its environs drew many publishers to set up sales operations and then acquire studios. Although a range of independents have started up and thrived in London, London has grown substantially due to the long term presence of Sony, Square Enix and Sega, most of whom have also recruited from outside the industry from London's thriving television, film and new media industries. London has in recent years seen the fastest rate of start-ups in the UK, almost all of whom are online (mobile and social network) games companies, and many without console games development experience.

Growth potential: Modest. London was one of the few major UK clusters to grow very slightly between 2009 and 2010 (most declined), but it remains vulnerable to global publishers potentially downsizing in future. London's high office and labour costs typically combine to drive larger companies to other UK or international locations. A high rate of start-ups carries the chance that

another Playfish will emerge and (if history repeats again), be purchased and then grown faster overseas.

Local support: Minimal. No games-specific support and only some generic business support is available in London, almost all of it national government schemes such as R&D tax credits (see later section on Financial Support), the odd grant (such as that from the Technology Strategy Board for university/industry collaboration) and generic investor schemes such as EIS and the EFG (see definitions). A very small range of grants are available from local councils for assistance with starting up or opening offices, but they are few in number, far from universal and of very limited value. The financial community, after backing hit-driven games businesses in the 1990s which failed, largely shies away from games investments but around a dozen remain actively interested in the sector, almost exclusively in network gaming. There is a national prototype fund backed by government funds and a few UK games companies have benefitted from grants encouraging industry/education collaboration, but on the whole there is almost no fiscal support.

Strengths: London's development cluster has a good spread of skills across platforms and most genres, with world class console, online, social and mobile developers. It benefits from being co-located with publishers as well as a growing number of broadcasters that commission games (like the BBC and Channel 4) and the wider media sector, including Europe's largest group of advertising agencies, who support a small advergaming sector.

Weaknesses: London has grown largely organically and its impact will remain reliant upon global publishers maintaining their headcount. It lacks a leading MMOG developer, but that is true of most UK clusters. It is not quite large enough to be safe in difficult times for games reliant on retail releases, but is transitioning towards network gaming faster than most of the rest of the UK.

3.2.7 Singapore

Estimated scale: c.500-600 staff work in development roles in the cluster, in around 50 companies.

Major local companies: Singapore is home to publisher studios such as Tecmo Koei, LucasArts and Ubisoft. It houses a handful of small independents, like Boomzap, Nabi and Playware. EA has located its Asia/Pacific headquarters there, as have THQ and Activision.

History: The sector was confined to a handful of mobile studios in the early 2000s before policymakers identified games as an area for growth. They have attracted some major publishers who have been developing handheld titles or conducting porting.

Growth potential: Weak. Since a few publishers set up modestly sized studios, Singapore has not experienced strong growth in development studios. It is thought to be the location of choice for online games servers for South East Asian (i.e. non-Chinese/Japanese/Korean) games companies.

Local support: Good. The Singapore Media Development Authority has announced it would pour $500m into growing a strong IT sector here, which explicitly includes a games cluster. The results are inconclusive, with the most positive impacts being server farms for Asian MMOGs. The government has announced bilateral deals with major publishers like LucasArts and Koei. A $16m fund for assisting the export of media was announced in 2010. DigiPen and MIT operate student and faculty swaps with local universities, and a range of grants and loan guarantees are available from Game Exchange and IE Singapore. In addition, Singapore offers a range of corporation tax exemptions with start-ups paying no tax, companies with under $500,000 taxed at 12.5% for 3 years, and 1-2% rebates on salary expenditure for start-ups over 2 years. Tax holidays for investors are also under consideration.

Strengths: The talent pool is well educated if pretty inexperienced. The corporate environment is healthy with low taxes, good infrastructure and the availability of financial support. Singapore is often chosen as an Asian headquarters location for media companies, and its location as a nexus of the internet backbone for the region is thought to have encouraged games companies to host servers for south-east Asian online games.

Weaknesses: Despite a decade's investment in infrastructure and 5 years after identifying games as a key sector, Singapore is still only a server location but not a major international games development hub and no indigenous games companies have reached material scale. Skillsets are still relatively immature, focused on handhelds and PC games, successful original IP creation is rare, perhaps due to a lack of cultural affinity to global markets outside of the Asian online and mobile markets, and no major titles have yet been developed there.

3.2.8 Seoul

Estimated scale: Between 10,000-11,000 staff work in development roles in the cluster, in 250-260 companies.
Major local companies: Seoul is home to games development and publishing companies such as Nexon, NCsoft, NHN (Webzen), Gravity, Hanbit, Gamevil and Grigon.
History: The domestic games market was triggered by the Korean government's massive investment in consumer broadband in the late 1990s and early 2000s. Gaming (firstly Blizzard's MMOG StarCraft) rapidly became a primary entertainment medium, and the domestic development industry, underserved by other territories, grew rapidly to create new service and commercial models for online games.
Growth potential: Modest. Seoul's cluster is bulky compared to other clusters and the MMOG market in Korea has been saturated for several years. This has dampened revenue and employment growth, and could continue to do so in coming years, despite the slow arrival of social network gaming in Korea.
Local support: Good. The Korean government has assisted local games companies since the early 2000s with generic grants and infrastructure, funded several trade bodies and even built free games development engines for developers (which were unused). Until 2008, most support was generic (R&D tax credits[51], SME tax credits[52], free economic zones with low tax regimes[53], low interest loans amongst others[54]), but the government recently put substantial support behind Korean companies, including $200m in 2008 to help games exports, which had begun to decline as Chinese domestic producers grew.
Strengths: Seoul has led innovation in online gaming, particularly on the commercial side, for over a decade. It helped pioneer the concept of games as services, won vast audiences to play MMOGs and exported its games across Asia and, increasingly, into the West. Its skills in PC and mobile games development and operation are world class.
Weaknesses: Korean games companies are much larger than their counterparts anywhere other than in China, which can lead to inefficiency. Its ability to originate new IP is more questionable, as most game genres are copies of Japanese or western designs. It has been slow to adopt social network gaming, possibly leaving it open to overseas competitors (such as Chinese or Japanese social games companies). There is little or no console industry in Korea, and therefore no developers in that sub-sector.

[51] The first 5% of a high technology firm's income is treated as a loss for tax purposes; 50% rebate for first 4 years covering R&D and employee development schemes; facility investment receives a 7% tax credit in the year of investment; foreign companies locating facilities in Korea may be awarded a cash grant (of unspecified size) for companies investing $10m or more in hi-tech or $5m in R&D, plus assistance with relocation, recruitment, training and land rents.
[52] Personal income tax, corporate tax (up to 3 years) and property tax (up to 5 years) credit of 50% in years 1-2 for SMEs and 'venture businesses'. Land tax and registration tax for business assets acquired within 2 years of founding a firm are exempted 100%.
[53] A broad programme of tax breaks aimed at all companies locating offices in the zones of Seoul, Incheon, Busan and Jinhae exempting corporation tax, Acquisition tax, registration tax, property tax and land tax by 100% for years 1-3 and 50% in years 4-5; 3 years tax exemption on imported capital goods; reduction or exemption in rent payments for redeveloped land; looser employment regulations.
[54] For more detail, see *Playing for Keeps*, GIC, 2007 http://www.gamesinvestor.com/content/research/Industry-Reports/Playing-for-keeps-%282007%29/

3.2.9 Paris

Estimated scale: c.1,200 staff work in development roles in the cluster, in 70-80 companies.
Major local companies: Paris is home to publisher studios such as Gameloft and Nadeo (Ubisoft), but it is dominated by independents like Quantic Dream, Darkworks, Eugen Systems, Cyanide and Kobojo; and service companies like Autodesk, Playsoft, Kylotonn, Virtools and Kynogon. French sales and marketing operations for SCEE, THQ, Konami and Sega are also located there.
History: Games development began in the early 1990s in a number of centres around France but the best funded was Paris, which grew its independent game cluster relatively quickly by pouring funds into console and PC games companies (€90m spent on 34 games projects by 2004) without much assessment of their commercial viability. Many (around half) went bust in the mid-2000s and many other companies were damaged by Quebec's successful targeting of French games companies for relocation through the 2000s. Half of France's developers now work on casual PC or mobile platforms.
Growth potential: Modest. Paris' development resources have fallen by another 25-30% since 2006, and while the 2007 games tax credit and other fiscal initiatives appear to have resulted in mild headcount growth, strong growth seems unlikely.
Local support: The Department of Paris (primarily through a €650m digital media fund called the Cap Digital but also through Capital Games), the national government and even a few prime ministers have supported video games companies for well over a decade, releasing substantial grants (up to €1m), subsidies, loan packages, matched funding programmes and, finally, a tax credit for cultural video games, which was approved by the European Commission in 2007 (See Finance section for more analysis). More recently, the $9.4m PlayAll scheme was announced by Cap Digital to encourage common middleware and tools development.
Strengths: Paris has a relatively strong grouping of handheld and mobile studios but also houses a strong cluster of tools and middleware companies, which has been stimulated by the PlayAll programme.
Weaknesses: High wage and employment costs, historically high company failure rates and a relative lack of global hits have constrained the Parisian and French games industries, and failed to attract large publisher studios despite the relative strength of the talent pool. Paris lacks major online games operators and has only one mid-scale social network game studio (Kobojo).

3.2.10 Small locations

Games clusters on islands and in more remote locations are rare and some governments in these locations have tried to found or boost games clusters over the years, with varying degrees of success. A quick review of these remote locations follows here:

- **Finland**: Finland is home to a thriving games cluster, led by industry-leading mobile studios Rovio and RedLynx, virtual world leader Sulake and console studio Remedy. Its location next to Nokia is no coincidence, and many mobile games companies have made games for the handset manufacturer. Finland's government has done comparatively little to assist the games cluster, but local mobile developers report that when their primary business model (work for hire for global publishers) was impacted in 2007/8 by the downturn in the Java gaming market, many existing companies and start-ups successfully won low-interest grants from government-funded bodies which enabled them to stay afloat and survive the transition to more sustainable business models.
- **Iceland**: Although Iceland has a successful MMOG company, CCP, it has developed only a small cluster of games companies, with under ten studios mostly focused on mobile. This cluster has grown organically without government intervention, although CCP won a small regional grant at one point.

- **Georgia:** This small US state has reported success in growing its games cluster (40% in three years) since offering a permanent 30% tax credit on eligible labour costs [55] from 2006 onwards. The relief has triggered start-ups as well as CCP to open a studio there. EA has expanded its relationship with a local university, and the state is good at promoting its subsidies and growth to the industry.
- **Manitoba:** The province has offered a 40% tax credit on eligible labour costs since 2008[56] (recently extended to 2013) plus an IP fund, an incubator programme for games start-ups (Fortune Cat) and various university and college links. The province has reported rapid rises in revenues from games made there between 2007-2010 but has paid out less than C$100,000 per annum via its Interactive Digital Media Tax Credit. Nevertheless it has built its cluster from a very low base to around 15 companies today, mostly focused on mobile.
- **Michigan**: The State voted a 42% tax credit on eligible development costs for film and games into law in 2008, but despite a number of applications, the film-focused government department has only paid out once to games (over 99% of funds were for films). Developers complain that the administrators know little about games, have not tailored the application process to games and strict IP ownership rules have excluded studios working for hire for publishers. One developer that relocated on the strength of the tax credits is suing the state after being denied funding.
- **Newfoundland:** The province has offered bilateral deals to games companies, including a $2.5m grant to Canadian-owned but California-based Ocean Interactive to build a 60-man work for hire studio in St John in 2008. The cluster however has struggled to maintain momentum and roughly half of its 7 companies had gone out of business by 2011.
- **Nova Scotia:** Since 2007, the province has offered a permanent 25% tax credit[57] on eligible expenditures (100% of salaries, 65% of third party labour remuneration and up to C$100,000 of marketing and distribution costs) for games companies' total expenditures (or 50% of salaries, whichever lower) as well as R&D tax credits and tax benefits specifically targeting US relocations. It also promotes links into its relatively strong universities. The province was already home to its largest developer, HB Studios. The cluster now numbers 12 games studios, mostly working on handheld and mobile, with estimated growth of 30-40% since 2007 from a low base.
- **Prince Edward Island:** The province launched its Gameplan strategy in 2007[58], offering permanent 35% tax credits for games production salaries, 17% income tax rebates for most games staff, grants and tax credits on exports. The province has grown from zero to around 10 companies, tempted New York-based Longtail studios to set up a studio there (the company also opened in Nova Scotia and Quebec) and operated an outreach programme via exhibiting at trade shows. Most of its studios are still small and focused on mobile game development.
- **Rhode Island**: Since 2006, the state has offered a tax credit[59] for motion picture production which includes video games but this was rarely if ever used by games companies and the state's small games cluster mostly grew organically. However, the State Development Corporation outbid Louisiana and some Canadian provinces in offering an unprecedented $75m loan guarantee to 38 Studios to relocate 200 jobs from Boston, as well as the tax credit. The state's hopes to build a 2,000 job games cluster look very ambitious, given the low base.
- **Utah**: Utah offered low interest loans and then a $5.25m tax rebate to Disney in 2008 on condition of creating a 200-man studio, which the company accepted. It is likely that EA Salt Lake has grown by benefitting from a similar deal. However, the state's games industry had already been growing steadily in previous years without any major incentives, due to strong universities and a good, if small, talent pool of local studios.

[55] http://www.georgia.org/GeorgiaIndustries/Entertainment/VideoGames/Pages/default.aspx
[56] http://news.gov.mb.ca/news/index.html?item=4439
[57] http://www.novascotiabusiness.com/en/home/locate/incentivesandtaxes/default.aspx
[58] http://www.gameplan.ca/business_advantages.html
[59] http://www.film.ri.gov/taxinfo.html

3.3 Characteristics of leading games clusters

Introduction

This section of the report analyses the characteristics of games clusters that have been grown organically (without government support) and inorganically (with government support). It will include a critical assessment of the most attractive factors influencing global companies' location decisions and the characteristics that contribute to a successful regional games eco-system.

3.3.1 Experienced talent pool

Arguably the single most important characteristic of a games cluster of any kind, but particularly the world class ones, is the size and quality of the talent pool of experienced staff in local studios. Talent pools can experience positive and negative momentum effects over time, in the following areas:

- **Recruitment from the pool**: Once a cluster achieves a certain scale, the talent pool attracts companies hoping to recruit from the pool. However, if the pool is too small, narrowly specialised or stops growing, the cluster will not gain enough momentum or critical mass and the cluster will either stay the same size (e.g. Singapore), or become dominated by a single skill-set (games company's call centres in Ireland).
- **Specialist immigration**: Global companies starting up new divisions in a cluster commonly bring in specialists from other centres to train recruits in the company's genres, technology and culture.
- **Training raw talent:** The cluster becomes increasingly self-sufficient by training up raw talent under the tutelage of the more experienced talent. Newly trained talent replaces more experienced staff lost to churn and grows the overall talent pool. If the pool is too small, not enough staff gain expertise and a loss of momentum slows or negates growth.
- **The poaching of experienced staff**: A number of clusters (Shanghai and Montreal in particular) experience high degrees of churn from staff being poached once they've been trained up. While this is endemic in inorganically grown clusters, Ubisoft has recently taken out an injunction (in Quebec) to stop THQ poaching staff.
- **Reducing damage from churn:** Churning staff looking to change roles are more likely to stay in a cluster as it grows larger due to opportunities for advancement in other local companies. Too small (India) or declining clusters (UK) can lose staff to brain drain.
- **Organic growth via start-ups**: The pool can experience organic growth as some experienced staff separate from their parent companies to start up new studios.
- **Start-ups can be triggered by downsizing:** During downturns when global companies cut staff in studios or close entire studios, clusters of a certain size can find the damage to the overall talent pool is limited through companies starting up. Guildford, London, Brighton and Newcastle have seen higher rates of start-up due to company closure or downsizing in recent years. Smaller clusters are more likely to experience brain drain but not recover.
- **Angels cluster around talent:** Angel funders that have come up through a cluster, sold and then begun to make investments in high risk early stage companies are more likely to be found near their cluster of origin, or other high value clusters (San Francisco in particular).

Many clusters list the main members of their cluster to show how strong a talent pool new arrivals can recruit from. Games talent pools exhibit the following features:

Large companies

The quality and scale of a games cluster's talent pool correlates directly with the number of larger companies in the cluster. The strategies of Montreal, Ottawa, Vancouver and many others for growing their clusters have been based on incentivising major games companies to locate studios there. This

usually means bilateral deals as well as creating a conducive environment for such companies (see all the following sections of this chapter).

Case study: Ubisoft in Montreal

Montreal's successful recruitment of Ubisoft to Montreal resulted in significant investment by both the company and the Province. Ubisoft announced 2 tranches of investment in 1997 and 2005, worth a total of $1.45bn, whereas the province disbursed up to $500m in tax credits, plus an additional $25m for infrastructure and training. Separate investments in education were also made (see later Ubisoft campus case study). These investments brought an influx of new talent into the talent pool from outside as Ubisoft incubated its studio using seasoned professionals from France and other locations. Ubisoft also recruited heavily from raw talent and other sectors. Ubisoft has heavily impacted the scale of the cluster which has seen unprecedented growth from job creation and the immigration of experienced staff. The company now has over 2,000+ development jobs in Montreal and its giant studio is the heart of one of the world's largest console games development clusters. As with many of its overseas locations (particularly Shanghai), Ubisoft has been hit by the aggressive recruitment of senior its staff by other global companies (notably EA, Eidos and THQ). The number of big studio 'graduates' from Ubisoft that have started up new studios in the area has as a result been minimised, because few start-ups can afford to pay their high salaries.

Balance of studios

The largest, fastest growing and thus most sustainable clusters tend to be characterised by a balance of big publisher-owned studios, and large and small independent studios. Many younger clusters (Shanghai, Montreal) started once a big global publisher was recruited, with indigenous independent studios coming later. For locations looking to start games clusters from scratch, a spread of studio types, platforms and genres may not be a realistic short-term target, but one for the medium term. However, we note that there are no recent clusters that have been started exclusively by independents and grown substantially as a result. Even some of the bigger independents located outside of large clusters – Bioware in Alberta, Ankama in Roubaix, or Guerrilla in Amsterdam – have not generated strong clusters around them, because they hoover up and then ring-fence the available local talent.

Company culture

The prevailing company culture of a cluster often plays a strong if intangible role in the development of its games talent pool. In San Francisco, strong networking and internet engineering skills merged with a risk-friendly and hard-working culture to create the social networking and, soon after, the social network games industries in the late 2000s. Companies co-located in San Francisco have a fairly open culture which allows ideas to propagate rapidly between companies that may not formally partner. This leads to the rapid establishment of eco-systems of developers building for platforms such as Google, Facebook or Foursquare. This can accelerate development of novel technology, commercial models and markets. However, this can cut both ways, when the culture is right or wrong. Arguably, the culture of hand-outs in Paris was immensely damaging to the long term health of the French games industry – which is still heavily (70%) reliant upon financing from Ubisoft, was ravaged by Canadian poaching and which has continued to decline in major clusters like Paris (although there is anecdotal evidence that Ubisoft has been hiring more staff in its Montreuil headquarters since the cultural tax credit). Global companies making location decisions are looking for hard, cheap, motivated as well as talented workers.

Case study: Ubisoft in Shanghai

Ubisoft launched a 500-strong studio in Shanghai in 1996. It was planned as an internal art and animation resource. The company chose its location because of local government support, such as subsidised office space, and low salaries. Shanghai was China's newest broadcast and interactive hub, benefitting from a healthy flow of graduates from good quality local universities. Ubisoft adopted a dual approach to staffing, bringing in western specialists while recruiting graduates. A group of veterans acted the new team's core and mentored raw recruits. Critically, it also needed local managers to oversee day-to-day operations. It headed the studio with senior Ubisoft staffers willing to spend several years in-country increasing capacity, capability and quality to service its internal clients. Early in its international expansion, Ubisoft was cautious about quality levels but aggressive on timing, investing in fairly high numbers of western experts as a proportion of total Shanghai headcount with the goal of getting the studio up to speed rapidly. Shanghai's graduates were recruited in volume by Ubisoft, whose studio quickly came to be seen as the best place for aspiring Chinese developers to gain hands-on experience, better than relocating to Japan or Korea to work on quality titles. Over time the studio came to be known locally as 'Ubisoft U'. The problem with being the graduate school for China's games industry was that the students wanted to graduate all too quickly. This combined with the rapid growth of the indigenous Chinese development sector and booming demand for experienced games developers led to a high rate of turnover of staff who left for better paid, more senior roles in new companies. The problem was essentially cultural, a deep-rooted lack of company loyalty primarily driven by the mentality of former state-owned enterprise employees who prioritised fast salary growth over commitment to the company training them. The result was a continuous flow of ex-Ubisoft producers, programmers, designers, marketing and sales people into local companies, whose rates as outsourced studios can today exceed San Francisco's. Many Chinese games companies are now run by ex-Ubisoft staff.

Clustering by platform and genre

Most clusters become skewed in the direction of the predominant platforms and sometimes, more rarely, genres that studios work on. This is a natural result of the long delivery time-frames for console games as well as developers trained in one platform or genre using those skills on similar platforms or genres if they break away to start an independent. We do see clustering of social companies in San Francisco (such as Zynga, Playdom, Playfish, Digital Chocolate, Kabam), online companies in Hamburg (Bigpoint, Innogames and Gamigo), and Austin (NCsoft and SOE), and even racing game specialists in the Midlands and the North East of England. Canadian promotional material for games describes the range of companies in different genres and platforms, demonstrating that the quite specific expertise required for these different genres and platforms is available in the country.

Negative typecasting

We have seen that some games clusters become characterised by the skillsets in local games companies, which can have a beneficial effect (as we have seen with social in San Francisco or online gaming in Texas). This can have a detrimental effect in clusters where the talent pool becomes typecast into a lower value corner of the games value chain. This is noticeable in several clusters. Mumbai and Bangalore are examples of Indian clusters where games companies have been 'relegated' by their international clients to lower risk tasks in the games development process such as art but not animation or programming. Subsequently, companies do not develop all the skillsets needed to develop games IP, which has reportedly frustrated some Indian staff wanting to develop whole games (who may then emigrate to locations where they can build whole games). Arguably, Singapore is an example of typecasting as a server hub but not a major development centre, and major investment by government has not resulted in much IP development there. Ireland is another

example (see case study below). This typecasting can result in companies bypassing a territory when looking for new studio locations, attracting more of the same kinds of company (as in the case of call centres in Ireland), and getting stuck with only a partial range of skillsets needed for full games development.

> ***Case study: Ireland***
> *Ireland has become the location of choice for American publishers wanting large support outfits to service multiple European markets. Blizzard, Riot Games and now Zynga maintain large call centres there, and PopCap has its European sales and marketing team there. While the local development agency IDA Ireland claims 1,500 jobs in video games, fewer than 10% of staff develop games and the remainder work in game servicing, QA and localisation[60]. Global games companies are attracted by the low salary and overheads costs, low corporation tax (12.5%/25% depending on the kind of trading income) and (albeit largely underused by games companies) R&D tax credits, good general educational levels and language skills. However a lack of programming, mathematics and arts graduates, and too small a development talent pool has ensured that Ireland remains a place to service but not develop games. This in effect limits Ireland's value creation to the lower salaries of service staff, reduced multiplier effects on GDP and more modest tax income from employment, as opposed to higher developer salaries, better multiplier effects, higher tax revenues and the potential for the creation and export of intellectual property. Ireland's new Horizon 2020 strategy launched in 2010 has yet to attract any development jobs.*

3.3.2 Raw talent pool

Another major characteristic of a strong games cluster is its raw talent pool, which is largely dictated by the strength of its educational establishments, whose output provides local companies with a sustainable source of substantially cheaper recruits to train up, but also by the overall size and quality of the labour pool. The characteristics of a raw talent pool are as follows:

Strong basic skills

Games companies do not expect new clusters to be overflowing with experienced games staff and, as we have shown, will often need to import some experienced staff. They do, however, expect at the very least an adequate flow of high quality graduates with degree level skills in programming, mathematics, arts, or, more rarely, general science or even engineering degrees. They will also recruit from other complementary sectors, such as multimedia, television and film production and advertising. Game development is a demanding career that requires high levels of basic skills, whose foundations lie in school level education that develops computer science and programming skills early enough to reach the required standards for higher education. This is the subject of lobbying by industry in more established games locations such as the UK, due to a perceived deficit in basic skills flowing from schools and higher education[61]. Common requests from industry are the promotion of STEM subjects to young people choosing courses, the establishment of kite marks for degrees such as the accreditation scheme run by Skillset in the UK (see below under Games degree courses), ambassadors to work with schools, career guides and games development competitions.

Games degree courses

Graduates from dedicated games production degrees can be extremely valuable to games companies and there are examples of student teams working in competitions such as the US Independent

[60] http://www.idaireland.com/news-media/featured-news/irish-games-industry-grow/
[61] The Livingstone-Hope review (NESTA 2010) contains a detailed plan for the UK government, games industry and various regulatory and educational bodies to raise standards in British schools and universities to meet the requirements of the UK's games industry for raw talent. http://www.nesta.org.uk/library/documents/NextGenv32.pdf

Games Festival or Europe's Dare to Be Digital being recruited en masse by games studios. For instance, a team from DigiPen in Redmond was hired wholesale by Valve after they demoed the core gameplay and technology for the subsequently multi-million unit selling Portal game series at the institute's career's fair. While there are some very strong games production degrees, hundreds of universities worldwide have jumped on the bandwagon and quality has inevitably suffered. As such, a university offering a games degree is judged by many in the industry as an optional extra rather than an essential pre-requisite for location decisions. This is primarily for two reasons. Firstly, games studios typically have to invest a substantial amount of time and money in training even well-qualified raw recruits to work with their systems, technology and company culture[62], and some have reported that this training does not vary greatly when the trainee has a games development degree. The other problem is that many games production degree courses (particularly and very publically in the UK) are seen to have delivered poor quality graduates which the industry has then publically denigrated[63] or found seriously lacking when independently assessed[64]. The UK's Skillset accreditation course is seen by many (although not all) industry insiders as the best way of guaranteeing quality, largely because it enforces standards, encourages work-based and team-based learning, and expects high degrees of contact with games development companies to keep the course's syllabuses up to date with this fast moving industry's latest production methodology and technology. Under 10 courses from the UK's 70+ games degrees are so far Skillset-accredited. High quality games degree courses are not universally found next to major games clusters, but some good ones are co-located with games clusters.

> ***Case study: Ubisoft Campus, Montreal***
> *Montreal sold the raw recruit potential of its 5,000 new multimedia degree graduates each year before it had reached critical mass in studios. Ubisoft recruited raw recruits locally and trained them using overseas specialists, whose relocation, income taxes and other costs for Ubisoft were subsidised by various government schemes. However, by 2005 Ubisoft had decided that these raw recruits were not at the level required for dropping straight into live production roles. It decided that the best way to guarantee the quality of new recruits was to train them in its technology, production methodology and pipelines, and team culture, before hiring them. Ubisoft reached a deal with the Provincial Education Department to co-invest in a Ubisoft campus, with the company investing $17m and by the Education Department $5m. 2 kinds of course are offered. Degree courses in local universities are supplemented by Ubisoft internships. The Ubisoft campus offers finishing school-type courses lasting 45 weeks. Both focus on delivering 'the portfolio of skills needed for video game production, programming, as well as 3D animation, 3D modelling and level design'. The initiative annually outputs 100 graduates from degree-level courses and trains 200 potential employees per year, many of whom are offered jobs and free education in return for guaranteeing a minimum tenure with Ubisoft.*

Industry collaboration with educational establishments

The closer that universities can work with industry, the better for both concerned and some of the largest games companies (like Zynga[65]) have dedicated staff focused on university liaison and recruitment. When such links are close, industry is more likely to perceive these establishments as

[62] See the Ubisoft case study, but some console studios report training schemes for raw recruits lasting 6-9 months before recruits are allowed into development teams (and then sometimes only at tester level).
[63] "There are already many university courses purporting to provide specialist training for video games and visual effects. But most of these courses are flawed, leaving those graduating from them with poor job prospects." Livingstone-Hope review (NESTA 2010)
[64] Blitz games in 2008 brought two entire classes from a local games degree course to train over 2 days but was so frustrated by the quality of their courses that it offered none places, despite having over 20 positions open for graduates.
[65] Zynga has a Director of University Relations, Brian Schneider.

listening to its concerns, staying up to date with its technology and processes, and being responsive to its needs. Industry benefits from the delivery of good quality graduates, which reduces their recruitment and training costs. Educational establishments benefit from the potential for internships, technology transfer and sometimes training from senior staff on courses. Universities collaborate with industry in different ways. Some simply run internships or ask developers to teach courses or give lectures to students. Some host games competitions which are judged by industry figures. Dare to be Digital is the leading games competition in Europe, which takes in teams of students from the UK and across Europe to compete in developing games from scratch to playable demos during residential courses that are co-funded by Abertay University and industry. The Obama administration announced a National Video Game Competition in 2009 to encourage games made by high school students and educational games made by professional developers, offering financial rewards and technology prizes part-funded by industry. Now in its third year, 500 students and an unknown number of professionals (it seems mostly video games degree graduates) applied in 2010. Some exploit their R&D capability to create new revenue streams. Again, Abertay University runs a cross-media lab to trigger collaboration between post-graduate level students, local games companies and traditional media companies.

3.3.3 Financial support

Arguably the most attractive features of any new or existing games cluster trying to influence the location decisions of global businesses is fiscal support. This can take a very wide range of forms, the major kinds of which are as follows:

Production tax credits

Tax credits based on developer salaries, production costs or simply all expenses for companies working on games are increasingly commonplace globally, despite the likelihood that they contravene WTO guidelines around state aid[66]. A list of the locations currently offering indiscriminate (i.e. rebates against total salary or production cost) subsidies is as follows:

Location	Tax credit and focus	Global companies post-tax credit	Assessment of success level of tax credit
Quebec	30-37.5% of salaries	Ubisoft, EA, THQ, Square Enix, Warner	High impact, major growth
Ontario	35% of salaries of work for hire projects, 40% for original IP	Ubisoft, EA, Take Two	High impact, major growth
Prince Edward Island	35% of salaries	None	Modest impact, modest growth
Manitoba	40% of salaries	None	Modest impact, modest growth
British Columbia	17.5% of salaries	None	Modest impact so far, modest growth
Nova Scotia	25% of company expenses or 50% of salaries, whichever lower	None	Modest impact, modest growth
Alabama	25% of production costs + 35% salary rebate for residents	None	Modest impact, negligible growth

[66] The UK government decided that despite such clear contravention that it would not be practical to pursue Canada through the WTO for a minor industry.

Location	Tax credit and focus	Global companies post-tax credit	Assessment of success level of tax credit
Arkansas	15% of production costs + 10% salary rebate for residents	None	Modest impact, negligible growth
Colorado	10% of production costs	None	Modest impact, negligible growth
Connecticut	30% of production costs	None	Modest impact, negligible growth
Florida	10% cash rebate on production costs	None	Modest impact and growth
Georgia	30% of production costs	CCP, EA (growth of existing college relationship)	Good impact and strong (40%) growth in headcount
Hawaii	15-20% of production costs	None	Modest impact, no growth
Indiana	15% of production costs	None	Modest impact, no growth
Kentucky	20% of production expenditures		Modest impact, modest growth
Louisiana	25% of digital media expenditures + 35% salary rebate for residents	EA, Gameloft	Good impact and growth
Maine	10-12% of salaries, 5% of production costs	None	Modest impact, no growth
Michigan	42% of digital media expenditures	None	No impact (almost no allocations, allocation cut)
New Jersey	20% of production costs	None	No impact / growth, suspended
New Mexico	25% of production costs	None	Modest impact, no growth, being cut
North Carolina	15% of salaries, + 20% of costs of linking to universities	Ignition	Some impact and growth
Ohio	25% of production costs + 35% salary rebate for residents	None	Modest impact, no growth
Rhode Island	25% of production costs	None	Modest impact, no growth
Texas	5-6.5% of production	EA	Modest impact, some growth
Wisconsin	25% of production costs + 25% investment tax credit for investing in Wisconsin-based productions + 15% income tax credit for starting up in Wisconsin.	None	Poor impact (allocation cut), little or no headcount growth, being cut

The following locations are considering or have legislation pending for tax credits:

- Ireland: The Culture Minister is officially considering tax credits for games production.
- Pennsylvania: Its Senator recently tabled a 25% tax credit for games developers.
- Massachusetts: State legislature is currently debating extending 25% film tax credit to games.
- Virginia (from 2013): Legislation already enacted will see the film tax credit extended to games in 2013.

Cultural tax credits

European states typically police their own adherence to WTO rules around state aid more strictly than other territories, and tax credits for games production are effectively illegal under European law, unless they fall in categories that are allowable under WTO. One such category is cultural products, which are exempt from state aid restrictions when so defined by the European Commission. France made the case to the European Commission over 18 months between 2006-2007 for production tax credits payable against games productions that pass a similar cultural test to that available for film in France and the UK. The French Ministry of Culture announced in May 2011 that 80 games projects had been assisted between 2008 and 2010, representing total production budgets of €285m invested in France by games companies, which cost an estimated €85m to the French taxpayer. The 20% tax credit (FAJV) was reformed in late 2009 following feedback from the industry to lower the minimum production budget (to €100,000), speed up the process, extend the period over which expenses could be claimed to 24 months, and provide guarantees against loans. No formal estimate of the measure's impact has been undertaken but it was reported that Ubisoft's recruitment rose by 30% in the year following the tax credit's first year of operation. None have yet followed France's 20% rebate, but one UK government did propose such a cultural tax credit which was then dropped by the subsequent government in 2010. The French trade body SNJV report that lobbyists (probably from the pan-European publisher group ISFE) are still working to repeal the European Commission's acceptance of a cultural exemption for certain games in Brussels.

Other reliefs

A very wide range of reliefs are made available by local and national governments, quangos and other governmental bodies. A brief overview of the main categories is as follows:

- **Bilateral deals**: A range of territories will assign senior policymakers to conduct direct negotiations with global companies to tempt them to locate new operations in their locations. These usually take the form of non-repayable grants designed to cover some of the costs of these companies in setting up and recruiting local staff. They are funded in a number of ways (several appear to be from discretionary funds assigned to a minister's department) and are often tied to the company delivering certain commitments, such as number of jobs created, facilities invested in, courses established with local universities and so on within a time frame. They are usually done on a bilateral basis, i.e. are not necessarily repeatable at the same scale, but can be used to kick-start or highlight longer-term and repeatable programmes from specific government departments.
- **Venture / IP funds**: A huge variety of funds types are available worldwide, designed to provide grants, low-interest, forgivable or convertible loans to companies. These are set up to assist companies from broad[67] or specific sectors[68], geographical areas[69], games in general[70] or even

[67] Such as the $361m Canadian New Media Fund, which contributes repayable advances towards market research, product development and marketing of new media products.
[68] For instance, the Institut pour le Financement du Cinéma et des Industries Culturelles, which funds French cultural media projects.
[69] Korea heavily funds businesses starting up in its Free Economic Zones, where companies located there benefit from exemptions from corporation tax, acquisition tax, registration tax, property tax and land tax by 100% for years 1-3 and 50% in

specific games platforms (not always successfully)[71] or genres[72], prototype funds[73], stimulate innovation more broadly[74], fund new products[75], incubate start-up companies or industries[76], encourage internships or training schemes[77] and so on. These can utilise public, private or a mixture of both sources of funding.

- **R&D tax credits:** R&D tax credits are another way around WTO rules and are generally used to stimulate innovation by many western governments (too many to mention here). The usefulness of R&D tax credits to games companies varies widely depending on how close the definitions for what is eligible expenditure are to development studios' actual expenditure, and on how loosely these definitions are policed by the managing authority. In the UK, the definitions were drafted in the late 1990s to assist the pharmaceutical and engineering industries and significant differences between these industries and games development mean that only a small proportion of a games studio's expenditure is currently eligible. The Australian government has recently tabled a generous 45% R&D tax credit worth $1.89bn over 5 years for games developers. The measure is described by the Australian trade body as having loose definitions for R&D, which include using existing technology on new contracts. It is also targeted at independents turning over under $21m per annum, which means that publisher studios are largely ineligible[78]. In the UK, in general these definitions are policed very strictly, resulting in an average of less than 2.5% of operating costs rebated by the credits[79], a level which, while welcome, is not substantial. After lobbying from multiple industries, the UK government agreed to widen the definitions in spring 2011.
- **Other tax credits**: Many provinces and states offer credits against sales tax[80], salary taxes for employees resident in the area[81], venture capital firms investing in new media companies[82], export tax[83], SME land and registration taxes[84] and so on.
- **Educational / industry cross over**: A wide range of funds, institutes and research programmes are designed to trigger research in high-value fields[85], kick off industry/educational collaboration[86] and generally build closer working relationships between industry and higher educational establishments. Some clusters have funds which exist to harvest ideas from

years 4-5; 3 years tax exemption on imported capital goods; reduction or exemption in rent payments for redeveloped land; looser employment regulations and relocation grants.

[70] Such as Nordic Games, which disburses €400,000 of Scandinavian governmental funds to 8-10 games projects from the region every year, utilising a board of experienced games staff to filter pitches.

[71] Another example is the Electronic Games Investment Fund was started with a grant of $36,000 from the Queensland Department of State Development and Innovation in November 2005. The goal was to raise at least $3.8m a year over the next five years to attain $19m in share capital with a minimum initial investment of $77,000 per project. The fund failed to raise capital and appears to have been shelved in 2006-7.

[72] Singapore's Media Development Authority have allocated $4m towards serious games, partly to establish an institute in Nanyang technological University and partly to fund serious games development.

[73] Abertay's prototype fund is government funded programme allocating up to £25,000 in largely non-repayable grants for digital media prototypes.

[74] Such as NESTA in the UK, a government funded VC fund which allocates seed funding in the form of equity or convertible loans to companies in nominated high innovation sectors.

[75] InvestQuebec's SMB Financial is a loan or loan guarantee scheme for 80% of multimedia projects including capital expenditure, patent purchasing and tax credit financing, minimum level of $44,000 for Quebecois companies.

[76] Singapore's Digital Exchange is a wide-ranging programme designed to bring businesses into Singapore.

[77] EmploiQuebec coves up to 25% of training programme costs.

[78] A separate initiative for larger studios is being lobbied for by Australia's trade body.

[79] Source: *'Powering a high technology recovery: proposals for improving R&D tax credits' TIGA 2011*

[80] British Columbia exempts sales tax on computers.

[81] Alabama and Arkansas amongst others offer rebates against salary taxes for employees of digital media firms.

[82] British Columbia offers a generic new media tax credit of 30%.

[83] Prince Edward Island offers an enriched investment tax credit covering 10-25% of export costs.

[84] Korea offers Personal income tax, corporate tax (up to 3 years) and property tax (up to 5 years) credit of 50% in years 1-2 for SMEs and 'venture businesses'. Land tax and registration tax for business assets acquired within 2 years of founding a firm are exempted 100%.

[85] Such as Australia's Cooperative Research Centres, which runs an interactive design programme.

[86] An example is the UK's Technology Strategy Board, which funds collaboration between industry and educational institutions.

universities[87].

- **Trade body funding**: Some governments part or wholly fund trade bodies which liaise with the industry and give grants to support specific initiatives[88], such as software development, incubation facilities, research grants, export grants, foreign visitor grants and so on.
- **Foreign specialist programmes**: Montreal specialises in attracting global companies which need to import specialists from overseas to kick-start games production and train new teams. As a result, there are a range of subsidies and incentives which assist companies[89] and individuals[90] relocate through grants, tax credits and other schemes.
- **Export missions**: Many territories have generic programmes that assist companies to export via trade missions, loan guarantees and so on. It is common in most territories with games clusters (including some with little other assistance) to subsidise attendance or exhibition at trade shows where they sell their services or products. The UK government organises trade visits with company speed-dating and company tours in target countries like the US, Japan and Korea. Some of this funding is channelled through trade bodies.

The efficacy of fiscal measures

While the use of production or cultural tax credits, grants and other programmes is widespread, their efficacy is far from universal. A review of government support for games clusters over the years yields the following lessons around best practice:

- Any support is backed by legislators and shows no signs of being repealed or suspended. New Jersey's tax credits have been temporarily suspended while they are restructured and New Mexico's are being cut by the Governor after a change in office, neither of which give any confidence to developers. However, Quebec's tax credits and its many other subsidies have lasted well over a decade and show no sign of slowing down.
- Tax credits are broad-ranging and lack complicated conditions. New Jersey's tax credits were poorly designed (according to their own Treasury) with a number of fiddly or difficult hurdles such as $2m minimum expenditure, job creation with minimum salary levels and so on. As such they had little or no impact. Other states advertise the lack of such hurdles.
- The support is easy to apply for via a support network of staff who assist with and expedite applications when necessary, are easy to contact and supportive. InvestQuebec has staff in multiple countries to recruit companies and then allocates staff in Quebec to help with both economic development work as well as administering the financial assistance. In contrast, some states provide little administrative assistance and some (reportedly Michigan) simply send 'request denied' letters for tax credit applications with no comeback or feedback.
- Support is administered and interpreted by staff sympathetic to games companies. Michigan has only disbursed one games tax credit (worth $500,000) versus 136 for films (worth $233m) and is being sued by a game developer for being denied a production tax credit. Many of the least used schemes are run by film agencies that occlude or excise the references to games in the legislation.
- Grants and tax credit processes are written with the process and timing of games production in mind, not copied from measures designed with more care for another medium, such as film. Michigan's games tax credits application forms are filled with references to film production, and differences in IP ownership between games and film mean that they effectively rule out games

[87] Such as the UK's Lachesis Fund in Derby, which is attached to a well-respected games degree course and related to a small but concentrated local cluster.
[88] Korea funds two such bodies, KOGIA and the Korean Creative Content Agency.
[89] InvestQuebec's Immigrant Investor Program gives non-repayable contributions worth from $35,000 - $438,000 to growth projects run by Quebecois companies over 3 years that require foreign specialists.
[90] Quebec's Ministry for Economic Development grants tax relief on salary costs for foreign experts engaged in R&D – 100% in year 1, dropping by 25% each year.

companies working for hire on publisher's IP – the most common source of financing and work for games studios.

- The support is well promoted, widely known and therefore utilised. Quebec's credits were the first and are now easily the best known globally, whereas many US states' tax credits (such as Ohio's, Colorado's or Connecticut's) appear to have never been promoted, are subsequently largely unknown and unclaimed, and therefore no developers can discuss the efficacy of such schemes more widely (as Quebec's global partners do).
- The support features significant levels of relief. Texan games companies benefit from a 5% tax credit but there is scepticism about government claims they have created 1,700 new jobs, many of which were created before the credit and most of which are related to the quality of the talent pool, not a highly marginal relief. Similarly, grants with low values are often under-subscribed because the opportunity cost of application can be above the value received.
- Support measures are well understood by local banks and other financial institutions who will offer loans in advance of the tax rebates or grants being received. This can mean providing letters of guarantee in advance of full approval and thus payment being made.
- The measures work in parallel with other reliefs, grants and bilateral deals offered in the same location without unnecessary duplication, and are often promoted by the same local agency. Quebec lists a sample P&L for a company showing how federal and provincial tax credits can work in concert to deliver over 60% in savings on salary costs.
- Their impact is widely promoted. Georgia and Louisiana regularly press release the ESA's economic impact of the US games industry in their state linking growth in their sectors with their tax credits. Quebec promotes the members of its cluster widely and loudly, and Ontario appears to have learned the same lesson.
- Their efficacy is monitored in consultation with industry, following which definitions and practice are adjusted over time. The French listened to their industry and adjusted the parameters of their cultural tax credit, although this may have been a deliberate delay tactic (after being curtailed by the EC during the review process, the French loosened and expanded the allocation 12 months later).
- Avoid funding technology for games companies with limited commercial potential. The Korean government funded the creation of an MMOG middleware, games engine and tool set which was given away to Korean games companies for free but was used by almost no-one apart from some interns as training. Paris has put money into creating common middleware and tool sets but the grants were made to commercially viable middleware and tools companies in their cluster. Its efficacy has not yet been proven however.
- Think about incentivising the creation of original IP. Broad-brush incentives targeting publisher studios can dampen the independent sector. Montreal's industry-leading incentives do not encourage original IP development or the retention of IP ownership, both of which are muted in the province. Ontario changed its tax credits in 2009 to give an additional 5% towards original IP development, but only for studios that retain IP ownership (possibly because this would introduce high levels of complexity and oversight to implement). A country-wide games competition for original new IP from independent studios was run in Canada in 2007 but has not been repeated (we assume because the games did not have enough commercial traction).

Private financing

Before the advent of wide scale government support for games companies, the industry traditionally had 2 sources of finance: trade finance (publishers paying for games development), and private funding (both equity and debt finance). The arrival of governmental support for games has not impacted the majority of funding for games (although some cluster's fiscal support is solid enough to be loaned against by banks and other financial institutions) and companies in most clusters still rely upon and need private finance sources such as angel investment, venture capital and other types of

private equity, bank-based loan financing, specialist gap financing, project financing and completion bonds. Some clusters (like Quebec) have the best of both worlds, being strongly supported by government but also with strong private financing for games. Other clusters have strong access to finance but little investment into games due to the immaturity of their cluster and lack of start-ups and potential investment targets (Singapore). Access to finance varies widely and the openness of the local financial community towards games tends to depend upon experience. British finance firms have only a few examples of positive games investment exits in recent years, and more bad examples of failed games studio collapses dating back to the mid-1990s. Some support agencies will assist with matchmaking games companies to private finance sources.

Case study: Financing of online gaming in San Francisco

Private financing of games in the last 10 years has been heavily dominated by online games companies, which has accounted for over 80% of all funding . The US, and particularly San Francisco, is the source and destination of a disproportionate amount of this financing. Online games clusters like San Francisco, Hamburg, New York, Shanghai, Seoul and Tokyo have flourished in close proximity to angel and venture capital-based finance sources, which have enthusiastically invested in more predictable games services (as opposed to hit-driven console products) which build and control their own audiences (raising exit valuations) and monetise more rapidly and sustainably using microtransactions and subscriptions. Clusters with traditional console and PC development (such as Quebec, London, Seattle*, Paris and so on) tend to have much less venture capital activity, be dominated by more traditional sources of finance (publisher development funding, debt and, when available, government support) and have fewer exits. San Francisco has benefitted from a virtuous circle of strong technology, great creative talent, risk-friendly capital and major cross-fertilisation with co-located platform developers like Facebook. A wide range of risk-friendly Silicon Valley venture capital firms have provided most of the funding for investment rounds. Social and other online games start-up companies located around San Francisco, Mountain View, Redwood City, San Mateo, Burlingame, Palo Alto, and San Jose have received that funding. Exits have been achieved at very high valuations (with revenue multiples of over 10) typically to traditional games companies and media firms looking to buy into new market segments like social, mobile and online gaming. San Francisco is another example of finance companies investing in talent and business models, not territories.*

3.3.4 Location

The location of games clusters has two primary characteristics, dependent on the type of cluster. For both historic and pragmatic reasons, many organically grown clusters are located near or within digital media clusters, from which recruitment of staff, cross-fertilisation of technologies, and access to finance can be facilitated. For instance, the San Francisco games cluster has always operated a rotating door to alumni and investors from Silicon Valley. It is no coincidence that the global social games industry is centred next door to Facebook in San Francisco. As we have demonstrated, this can take on its own momentum and can become self-sustaining. The Vancouver games cluster was located where Hollywood had been outsourcing 'runaway productions' for years and where Californian games companies could easily access good staff but at lower costs.

The value of proximity

For inorganically grown clusters, location is obviously not subject to choice, although measures that facilitate the import of specialists and academic ties between universities in big clusters can make a cluster more attractive. Inorganically grown clusters will sell themselves based on general proximity to a client base (e.g. publisher headquarters in California and UK/France, or Tokyo) if appropriate i.e. Quebec is equidistant from California and Europe. The further away the cluster is from these centres,

the more that parallel working based on complementary time zones (e.g. the client or head office finishes work just as the contractor or subsidiary starts work) is sold. More awkward time zones between centre and outpost have not stopped Australia from becoming a cluster (albeit a small one) in its own right. For service sector companies in more remote time zones (Vietnam for instance), technological solutions such as online production management systems become more important to make the process of tracking what's being built and approved by whom more efficient. However, games development is a globalised industry with centres around the world. Closer location near or at least within relatively easy reach of major games industry centres is useful but by no means the pre-requisite that it once was. Closer location (i.e. Ireland and the UK) is no guarantee that collaboration will happen, because there is little practical difference between a 45 minute flight and a 2 hour flight.

Cultural proximity

In a globalised industry, cultural proximity is probably more important that geographical proximity. Cultural proximity has been as useful for Canada as its geographical proximity because Canadian subsidiaries are producing games for the North American and European markets, with which Canadians have strong roots and affinity. Cultural proximity, lower language barriers as well as technical expertise and cost are why India has become a centre for offshoring of certain tasks (for games it is low to medium level art creation), but major games development has not become located there because of subtle but important cultural differences, as well as the lack of a long-term domestic gaming market. Developers cite intangible cultural assumptions that can get in the way of communication (e.g. the common example is colour: green in India is different to green in California), and language barriers still exist, both of which raise the cost of project management. So, cultural affinity is useful but, as demonstrated by the success of Shanghai as a location for global publishers, its absence is not insurmountable.

3.3.5 Local economics, quality of life and legal context

Most clusters promote the generic characteristics of their locations, such as these:

Basic economics

The basic economics of a location are bread and butter sales tools for many games clusters. Average salaries, cost of living, office and overheads costs, local taxes such as corporate tax and so on are subject to 'compare and contrast' exercises by the development team selling the location to games companies. Quebec promotes its cost-effectiveness by using or even commissioning studies into annualised costs of doing business[91], median games developer salaries in 8 US states and 2 Canadian provinces with games clusters for 4 grades of programmer[92]. This allows it to boast that, before subsidies, its salaries are 21% lower than the US average for multimedia. It also contrasts office space rental costs very favourably versus other major cities. Games companies may glance over unemployment figures as another way to grade the suitability of a cluster, but it is such a specialised sector that this is marginal. Economic, financial and political stability have not been forcefully sold to date but may need to be reinforced in the current financial climate. Another basic is the ability of newly arrived businesses to get business permits and register with tax authorities to operate there, which the better agencies help with.

Labour laws

Labour mobility, regulations and trade union relations may be another feature that is not as heavily promoted but could be important during the games company's deliberations, if unusual compared to other locations. Global companies want the ability to hire and fire staff at relatively short notice

[91] Recent leaflets quote KPMG's Guide to International Business Costs which include labour, electricity, transportation and telecommunications costs, interest, depreciation and taxes.
[92] From the Economic research Institute in Washington.

without penalties. Poor labour mobility combined with high administrative and tax costs has been another reason that global publishers (apart from Ubisoft, a French company) have never opened large outfits in France. Similarly, Malaysia, home to tiny games cluster, is a harder sell due to the requirement to hire ethnic Malays (almost none of whom have made games) in every company. Good local development agencies help new arrivals navigate regulations around hiring, working time and work permits for foreign specialists.

IP protection
A strong legal environment that protects IP is another important aspect of a global company's location decision. Western Europe tends to be strong on piracy, a touchstone issue for publishers, while Russia, China and much of South-east Asia has a bad reputation for loss of IP (via outsourcers) and loaded legal systems that make it hard to protect or retrieve funds and IP. Ubisoft and other western publishers appear to put up with poor IP protection in China, but they also build robust IP protection systems. Finally, any hints at corruption (for instance in Indonesia and Malaysia) will put off all but the most persistent global companies. These may be impediments for global companies, but not for local companies, who understand how to work around them.

Infrastructure and real estate
Transport, IT and telecommunications infrastructure will be on global companies' check lists but are assumed to be a given unless in an unusual location. We note that growth in Canadian games companies did not stall when there were massive power cuts on the Eastern Seaboard of North America in the late 2000s.

Quality of life
Games studios are renowned for working their staff hard, particularly at crunch times, but quality of life plays an important part for companies looking to relocate staff to the new location. The industry is staffed by young, highly educated and well remunerated people, for whom a thriving metropolitan centre stands a stronger chance of attracting large games companies than a rural location. Too many public holidays may also work against many North American publishers.

3.3.6 Local support

The final but one of the most important long term characteristics of successful inorganically grown clusters is the quality of support from the local development agency, which builds the cluster, recruits new arrivals and helps them as they land and build capacity.

The local development agency
The main function of a local support agency is to promote all the characteristics of the cluster that are attractive to games companies. As we have listed elsewhere, local agencies:

- Gather the latest research on the industry so representatives are up to date with the latest industry trends, practices and concerns.
- Gather data on and then promote the talent pool, including its scale, range, skill sets and quality.
- Highlight local companies of global prominence, demonstrating spread of genres and platforms.
- Match-make local support, such as training or specialist immigration or relocation grants to incoming companies.
- Help incoming companies find office space and local recruitment agencies to source local staff.
- Assist start-ups with funding, incubation and grants.
- Promote the quality, skill sets and output from local universities.

- Encourage industry-university collaboration through internships, grants and kite marks and encourage university partnerships with better known universities in larger clusters.
- Seek out and prepare ground for bilateral deals between senior policy makers and incoming global companies.
- Promote, facilitate and, in some cases, administer a range of fiscal support for games companies.
- Match-make incoming companies to local private financial institutions, assisting them source financing solutions including loans, loan guarantees and working capital.
- Solicit, process and implement feedback from industry about companies' concerns, triggering new programmes and support if appropriate.
- Promote cultural proximity between location and incoming company.
- Promote local economics, salaries, office costs, cost of living, labour mobility, IP protection and infrastructure.
- Assist with local bureaucracy such permits, labour laws and other paperwork.

This support is promoted through the following channels:

- Trade shows (booths, leaflets[93], meetings and, rarely, presentations).
- Trade magazine and website advertising.
- Invitations to companies to visit made during meetings or, with much lower efficacy, via cold calling companies.
- Press releases, reports and local company news.

The local support agency takes responsibility for many of the characteristics of fiscal support that are listed in the earlier section (The efficacy of fiscal measures). There's no more effective agency in this field than InvestQuebec, which is a model of best practice. The agency combines the functions of a local development agency with a financial consulting company, an approach which makes them effectively a 'one stop shop' for arriving companies. They produce newsletters and promotional materials[94], exhibit at major trade shows globally (like many of the Canadian provinces) and since they administer the tax credits, they can expedite the process of obtaining the financial benefits that persuade games companies to locate in Montreal.

The impact of overly aggressive promotion

Although the work that these local development agencies do can be highly effective in recruiting global companies to locate in their areas, this researcher notes that it is not universally successful and can have unintended consequences. Several Canadian provinces have sent delegations to trade shows in North America and Europe (notably the UK) to try to persuade companies to relocate. To date, whole independent studio relocations from the UK are rare, because unsubtle sales pitches – cold calling or leaflets advertising relocation dressed up as Canadian passports left on seats at conferences – have triggered a degree of nationalistic pride in the UK industry and trade press, thus counteracting the positive press releases and news stories put out by the agencies.

Trade bodies

Some clusters feature trade bodies that are set up by industry. These bodies have varying levels of political and industry power. TIGA and UKIE in the UK, and the SNJV in France have some political power, but they are relatively rare in global clusters. Other organisations, like IGDA, European Game Developers Federation or the Shanghai Game Developers Association are too diffuse or disorganised to carry much political currency. Independent trade bodies provide networking functions, training, recruitment, industry promotion and showcasing at trade shows, educational and other programmes,

[93] An example from Quebec: http://www.investquebec.com/documents/en/publications/BrochureGaming2010_en.pdf
[94] http://www.investquebec.com/documents/en/secteur/Multimedia.pdf

and can negotiate discounts on services for members, run events, and produce a variety of reports, studies and best practice guidelines such as model contracts. In some clusters (Korea for instance), these trade bodies are either government funded or government-run, and their output differs subtly from independent trade bodies, which tend to be more campaigning than promotional.

Generic support

Most countries offer a range of generic business support services that help companies get up on their feet, open their first offices and get started. These services can be incubation (offices housing multiple start-ups with subsidised or pooled rates), generic consultancy and other support services (such as legal and accountancy), start-up grants or loan guarantees for small businesses. Some (especially Korea) encourage location in special economic zones where many rates or taxes are subsidised or exempted altogether.

Cluster scoring

	Quebec	San Francisco	Seattle	Hamburg	Shanghai	London	Singapore	Seoul	Paris
Experienced talent pool	6	10	6	5	5	9	2	4	6
Raw talent pool	7	10	8	7	8	8	3	6	5
Fiscal support (public)	10	1	4	3	2	2	6	7	10
Fiscal support (private)	7	10	7	6	8	4	3	8	7
Location	5	10	10	7	10	10	2	10	6
Local economics / legal	9	5	5	7	8	5	6	8	1
Local support network	10	2	1	5	2	4	6	7	5
Weighted total	66	68	53	50	53	60	32	58	52

Scoring criteria

- **Experienced talent pool**: The breadth and depth of talent pool found in games companies working across multiple platforms.
- **Raw talent pool**: The strength and scale of the flow of graduates from high quality degrees and from adjacent multimedia industries.
- **Fiscal support (public)**: The scale, availability and range of games-specific public fiscal support.
- **Fiscal support (private)**: The scale and openness to funding games companies in local private finance sources.
- **Location**: The proximity to major games clusters (high scores mean that the cluster is large enough to house the entire games value chain for a territory or region) and general quality of life.
- **Local economics / legal**: The cluster's average salaries (lower = better) balanced by local legal flexibility for hiring staff.
- **Local support network**: The effectiveness and experience of local support staff helping games companies locate there.
- **Weighted total**: A total score for each cluster taking into account the importance of quality of talent[95].

[95] A three times weighting has been applied to the experienced talent pool score.

Chapter 4: The Local Audit

Lead Authors: Gordon Calleja, Jeanine Rizzo, William Latham

4.1: Assessment of Available Skills and Expertise in the Local Labour Market

The availability of talent in a territory has an important bearing on its viability as a potential location for both a local and incoming game companies to grow and flourish. The lack of an established games industry in Malta means that related industries need to be sourced for recruitment of experienced talent. This section assesses the availability in Malta of skills needed in the game industry as outlined in previous chapters. This data was accumulated through consultation with leading design and marketing companies, existing game companies in Malta, recruitment agencies and software developers along with the educational institutions covered in section 4.2, as well as consultation with the Culture and Creative Industries working group (at least in relation to the art roles).

Role Name	Areas of Expertise	Availability	Level
Lead Artists	art vision, quality bar, discipline leadership, scheduling, art reviews & critique & direction, relationships with other disciplines	Low	Low
2D/Texture Artists	photoshop, illustrator, ability to apply textures in 3D tools	Medium	Medium
GUI/HUD Artists	2D animation, simple scripting abilities, tools: flash, silverlight, illustrator	Medium	High
3D Modellers	implement 3D models, work from concept art, apply textures, tools: 3D-Studio-Max, Maya, Z-brush	Medium	Medium
Character Modeller	specialist skills for characters, clothing, creatures, often overlapping with modellers and animators	Low	Medium
Animators	block-out animation, keyframing, motion-curve editing, motion-graph integration/preview, tools: 3D-Studio-Max, Maya, Motion-Builder, Motion-graphs e.g. Morpheme	Low	Medium
Technical Artists	own art performance, shader creation, character rigging, memory budgets, create art pipeline process, monitor and fix workflow, export and publish assets to game	Low	Low
Concept Artists	2D concept art, tools: physical media, photoshop, paint-overs, video-capture	Low	Medium

Role Name	Areas of Expertise	Availability	Level
Outsourcing Managers	outsource selection & process, briefing, review, approval, budget ownership, product scoping, design iterations, schedule reporting	Medium	Medium
Writers	writing words, storyline development, character narratives, branching-conversations, standard responses	Medium	Medium
Audio Lead	audio vision, discipline leadership, outsourcing selection and management, setting quality-bar, relationships with other disciplines	Medium	Medium
Sound Designer	sound effects, foley work, recording sessions (dialogue etc), tools: protools, soundforge, synths, mixing desk	Medium	Medium
Composer/Arranger	compose themes, arrange for instruments, sequence to preview/final, rehearse/perform live musicians	Medium	High
Sound Studio Manager	run sound studio, schedules, equipment updates, run recording sessions,	High	High

Table 4.1a: Art Roles and Supply

Table 4.1a shows a list of artistic and creative roles within the game industry. Each of these roles is accompanied by an estimation of the degree of availability and level of expertise existing in the Maltese labour market. These are aggregate scores derived from estimates given by a number of professionals in the field for each job role (see appendix for full details).

The digital media production sector in Malta is, for the most part, focused on web development. Almost the entirety of digital media practitioners are dedicated to graphic design and web development. This means that, when it comes to 2D graphic design using software such as Illustrator, Photoshop, Flash, Silverlight and the like, there is a good supply of talented individuals whose skills could be appropriated for recruitment in the game industry. These individuals are employed in marketing and design agencies and tend to work on either graphic design for advertisements or web. The level of work examined was of good quality, at least in the current, non-games industry capacity. This web development focus makes creative design individuals from Malta suitable for working on mobile, tablet and browser games, supplemented with additional specific skills. This has comparisons to the ICT Industry where these is a strong pool of generic talent that can learn quickly and adapt to new challenges.

Concept artists that work to a specified brief, on the other hand, are not as easy to find in Malta. Most artists in Malta practice their craft as a hobby and even if they have raw talent, tend to have not applied their talent at a demanding daily job.

Artistic work has, for a long time, been seen as the domain of a special few. This mentality is changing, but there is a lot of catching up to do to professionalise the creative arts. At the University

of Malta, for example, it is only in recent years that hands-on creative courses have been accepted into the curriculum. Traditionally, the applied arts have been seen as the domain of schools offering diploma courses at lower level than University, thereby implying that such subjects are not as academically important as other, more theoretical courses. The situation has changed considerably in the last five years with the University of Malta starting up more creative courses and MCAST Art and Design being established and producing creatively promising students. The overall quality is very good but needs a specific undergraduate courses specifically for games industry requirements with additional short courses around specialist games industry skills. Once the specific games courses are added this will in future start to service games industry needs in Malta. Involving companies locating to Malta in the shaping of those games focussed courses will be very important.

The situation is more challenging when it comes to digital arts outside of graphic design and web production. Skills like 3D modelling and animation are rare in Malta and as all participants commenting on the issue have pointed out, there are only a handful of individuals that possess these skills at a professional level. This means that Malta is not only missing the creative and artistic skills specific to game development, but also the skills used in surrounding digital media production. This presents a tough challenge for Malta as the lack of talented digital media professionals means there is also a lack of people to teach such courses at higher levels of expertise.

As leaders in the Malta design and advertising world have pointed out during the local audit interviews, an important reason for the lack of supply and expertise of digital media creatives is the lack of big budget jobs available in Malta. The demand for skills such as 3D modelling and animation is not high enough to employ dedicated people doing that work. Participants cited a lack of appreciation for originality and artistic quality in the Maltese clientele as another source of the low standards in digital media and related areas in Malta. Clients tend to request jobs based on the visual design of competitors, rather than requiring innovation. The larger clients are sometimes more open-minded, but these clients are few and far between. Lighthouse and Ashley described how even when the agency offered to do more creatively interesting jobs at no additional cost for clients, they rejected the proposal as it did not conform to what they were used to in the local media, which obviously suffered from the same creative cramping.

The variety of work that a creative at such agencies needs to engage in to cover the limited budget jobs coming in means that specialisation is difficult to attain. Most designers work on a variety of different platforms and tasks. This makes the Maltese creative workforce a flexible and adaptable workforce, but one which lacks specialisation, and thus, the high level of quality needed for the game industry. This means that incoming companies can expect to do a considerable amount of re-training, but that the uptake from Maltese employees will be rather fast. This faculty is present in many local industries and although not always an obvious advantage, and with its downsides, it is an asset that is indicated by the ease of attaining work in more dedicated environments that Maltese workers find when moving abroad. This pressure to succeed in multiple domains simultaneously is also seen in the educational system, which will be discussed in section 4.2.

The agencies interviewed primarily service the local industry with very few foreign clients. This led to saturation in the local market as more design and advertising agencies were established and grew. The local market can support only so much work, which has kept prices on the low end of the scale and thus, once again, reducing the scope for creative work.

Another missing element in Malta that impedes progress in the creative domains is the lack of a critical forum were creatives working in the graphical arts can get feedback on their work from a visually literate audience or each other. There is a lack of a unifying community where artists can

share ideas, learn from each other and collaborate. More importantly, the lack of an artists' association or guild means that there is no unified voice which can reach out to government and private institutions to initiate change in the current situation. This lack of governance structure is being addressed by the Culture and Creative Industries Working Group with the establishment of associations that will collect and represent various clusters of creatives in the near future.

When it comes to writing the participants had different opinions on the level and competencies of writers in Malta. Some felt that the level of writing in Malta is poor and the few writers around have a hard time writing to a brief. Others felt that there is considerable talent in the writing world, but it has so far mostly been in Maltese literature, for the most part. The most commonly cited writers are script writers that have worked on TV shows. Reviewing a sample of local writing in English it is clear that the amount of competent writers locally is limited and the level, with a few exceptions is also moderate and mostly amateurish.

The situation is different when we consider the local musical talent. This is the one area in the creative skill-set required by the game industry that Malta has both an adequate supply of and also a good level of expertise in. Malta has an abundant supply of musicians, which although are mostly non-professional, in the sense that they maintain a job on top of their musical career, the dedication to their musical practice tends to be prioritized over their day jobs. Like other creative jobs, the low budgets do not allow companies to keep a dedicated professional musician on board, but employ freelancers. There are professional musicians on the island, of course, and these tend to be of a high quality and are able to both compose and perform. A number of design agencies and audio visual divisions have dedicated sound studios. When it comes to sound, therefore, Malta has an adequate supply of musicians that can supply the games industry.

In terms of game-specific skills, such as game design, level design and so on, the existing competencies are limited to a handful of foreigners that have recently moved to Malta. As these are less than five in the whole country, they cannot be counted as a substantial resource in supplying labour to an incoming game industry.

Role Name	Areas of Expertise	Availability	Level
IT Administration	desktop support, server maintenance, equipment purchase and setup, application install/config/maintain, backups, networking	High	High
Player Analytics and Data Mining Experts.	statistical analysis and strong maths skills, gained from the iGaming industry, some programming involved but not always essential in this role. Work closely with sales and marketing experts.	High	High
Database Programmers	SQL, webforms	High	High
Tools Programmers	user interface rich applications in many technologies, e.g. MFC, C#/.NET, Java	Medium	High

Role Name	Areas of Expertise	Availability	Level
User Interface Designers	halfway between art and programming, should understand GUI design and implementation – often become web-based	Medium	Medium
Network Programming	client server models, performance, bandwidth optimisation, real time synchronisation	Low	Medium
Graphics Programming	knowledge of 3D, animation, hardware rendering – e.g. military work	Low	Low
Simulation Programming	scientific, business simulation	Low	Low
Mobile Programming	native applications for iPhone/Android	Low	Medium
Embedded Systems Programmers	expertise would translate directly to many game-console environments.	Low	Low
Web Programmers	expertise would translate directly to many game-console environments	High	High
C++ Programmers	typically have some mix of Java, Javascript, HTML(5), Flash, SQL, PHP, AJAX,	Medium	Medium
Systems Architecture	senior systems designers, analysts, capable of dealing with customers and business cases	Medium	Medium
Customer Support Technicians	capable of fielding technical problems, solving or escalating back to core development teams	High	Medium

Table 4.1b: Technical Roles and Supply

Turning to the availability of technical roles we find a more favourable situation when it comes to supplying skilled labour to a developing game industry. As in other areas, there are a handful of coders that have experience with games and none of these have worked on a game full-time.

In the case of technical roles, however, the related industries have a good supply of experienced and skilled labour that can be utilized by the games industry. Part of the reason is that the educational institutions are better equipped to produce coding talent that can be re-trained to suit the needs of the specific company with in a much shorter time than it would take to develop artistic talent from the ground up.

The supply of C++ and C# coders is more than adequate to support a small number of small to medium teams or a single large operation. The level of expertise is, from reports of existing software developers, high enough to adapt to most kinds of development work, given adequate time to get used to the tools and new environment. Web developers, tools programmers and database programmers make up the majority of the existing pool of developers and thus there is a good supply

of talent in these areas. Similarly, there is no shortage of IT support and administration staff. One particular area of expertise Malta has developed is in the support of server banks and data centres, originating from the needs of the large number of gambling companies that run their operations from Malta. Reacting to this need Malta now has a number of high-end data centres serviced by local staff (see section 4.8 for further details).

There are areas within technical roles that Malta has little or no expertise in. When it comes to coding skills which are not used in mainstream applications, tools development and other, more general forms of software development, Malta offers very little if any, skilled labour. Graphics and physics programming, and all aspects of game engine programming are absent. Similarly, there is a lack of developers working on mobile platforms. There are some web developers that are looking into moving into developing apps for iPhone and Android, but these are still in their early stages. There are a few individuals that have competencies in these areas but these would literally be a handful at best. An example of such a team exists at Crimson Wing. Although not an aspect of their daily work-load, a group of programmers from the Research, Development and Technology department have created their own graphics and physics engines as well as some simple games that run on these engines. This was an old project that they did not take further, but two of this team are working on their PhDs in this area and thus have potential to develop it further in the future. Nevertheless, this is very much an exception to the majority of programmers in Malta that tend to deal with more general software development.

Gambling Companies

Malta has attracted over 350 gambling companies to its shores over the last years. Out of these 350 around 100 companies operate from Malta. Maltese legislation requires that in order to benefit from the tax incentives available to foreign shareholders all that a company needs to be physically based in Malta is a key official and the control system. Nevertheless, the 100 companies that have more extensive operations running from Malta employ over 3500 people. These are made up of customer support (by far the largest portion), fraud and payment officials, marketing people, systems administrators, payment gateways and book makers.

Our initial assumption was that part of the 3500 gambling company employees would be doing all their core development work on iGaming software on site in Malta that could form a pool of skilled individuals that could transfer into game development when game companies move into Malta or local companies expand requiring programmers.. As participants explained, since local development is not required to benefit from tax incentives gambling operators prefer to develop in their established hubs for various reasons. The first is that there is not a large pool of local expertise in developing such applications, secondly, the talent that does exist locally is more expensive than other locations like Eastern Europe and finally, the larger of these companies pool their development team in one location and Malta had no particular advantage in attracting such development hubs.

Through interviews it became clear that there are valuable and existing skilled individuals in Malta with expertise around player analytics, statistical analysis and data mining from iGaming that are local. One aspect that emerged from these interviews was that experts in this area, did not necessarily need to be programmers, but was viewed a bonus skill to have. They form a bridge the gap between development and sales / marketing, These analytics skills are directly transferable to the game industry particularly around mobile, browser and online tablet games with associated microtrancition and emerging freemium models.

Since the majority of staff employed by gambling companies in Malta relates to multi-lingual customer support, payment management and marketing, there is scope of the gambling companies directly

(outsourcing) or indirectly (through shifting of employees) servicing incoming game companies, but such services are discussed in more detail in section 4.4.

4.2 Overview of the Local Educational Institutions in Relation to the Video Game Industry

Malta's lack of natural raw materials means that its prime resource is its skilled workforce. For Malta to remain commercially competitive and evolve economically it needs a highly skilled, educated and talented work-force. Education is thus a major concern on the island; a concern ranging from parents all the way up to government.

Maltese education is of a level comparable with other European countries at all levels. One of the limitations that the local education has, particularly at tertiary level is that due to the small size of the country there are a number of areas for which there is little or no offerings. These tend to be more specialized areas rather than whole disciplines or fields. This is understandable when one considers the small population and GDP of the country.

For the scope of this report the more worrying blind-spots in the Maltese educational system are, particularly at University level, practical courses that develop artistic and creative abilities. This is particularly lacking when it comes to the creative digital arts but is common also to more traditional visual arts. This gap is currently being addressed by new courses introduced at the University of Malta and games courses at St.Martins Institute and the programmes offered by MCAST Art and Design, but due to the lack of high standard courses and programmes in the past, there is a lack of a critical mass of experienced talent pool with a fine arts education that can teach such courses.

When it comes to game-specific education, there are no established, dedicated programmes at the time of writing, but a number of courses at various levels are being established by various institutions. We will now give a brief overview of the educational institutions that provide courses that would be useful, directly or indirectly, to the game industry.

The University of Malta

The University of Malta is currently the only tertiary institution offering both undergraduate and postgraduate degrees. It is a publicly funded university, open to all who have the requisite qualifications. As a signatory to the Bologna Agreement, the University has reviewed its structures to match those of other European Universities allowing greater flexibility for its students and those of other European countries to consider exchange possibilities with the Erasmus framework. Academic work is on par with European and American institutions with whom the University shares numerous faculty and student exchanges.

Currently the University caters for over 10,000 students enrolled in 13 different Faculties and a number of institutes. Just under 10% of the students are foreign students from over 60 countries. All instruction is in English except in foreign language classes where normally instruction is held in the language being taught. While enjoying high academic repute, the University strives to be responsive to the infrastructural and industrial needs of the country. Annually around 3,000 students complete their studies and graduate at the University. Many look for employment in the local market while an ever-increasing number look for overseas employment opportunities availing themselves of European mobility.

The university also manages the Junior College, a pre-university college with a population of around

3,000 students.

At a generic level, the University offers a comprehensive range of courses benefiting the eventual establishment of a digital-games industry. The Faculty of Economics, Management and Accountancy (FEMA) offers undergraduate and postgraduate programmes allowing students to take management and financial roles. The Faculty of Information and Communication Technology (ICT) offers computer programming to students who could be employed in the digital games industry. The Faculty of Media and Knowledge Sciences (MaKS) currently offers media production and design courses that could be brought together for the provision of content. Although project managers or producers, for example, are not offered game-specific courses (as yet), students reading for an MBA or Management Studies diploma have the background skills needed and can adapt to a game-industry specific job.

The Faculty of Information and Communication Technology currently offers a number of courses such as the M.Sc. in Integrated Product Development, or in Information and Communications Technology. These programmes of study cover, at various levels of direct application, all roles needed in the game industry. The focus or practical applicability of such courses is yet to be ascertained, but on the basis of interviews with software developers it is clear that there are sufficient graduates that could work in the digital game industry provided a degree of re-training is provided. Furthermore, the University is willing to work with industry at enhancing local human resources with short programmes to meet emerging demands.

Given the emerging interest in digital game-production as a strategic development, the University is planning to offer game-specific technical courses to students at the time of writing. A number of courses are tagged by the Faculty of Information and Communication Technology as having game-relevant content and game-contextualisation, forming a game-specialisation stream. Although not a dedicated games course this sort of contextualisation is a good first step in addressing the needs of the digital-game industry.

Artistic content and roles are more problematic. In October 2010, the Faculty of Built Environment launched a multi-disciplinary, cross-faculty diploma in digital design called Design Foundation Studies. This diploma offers students a number of classes in digital design that would be helpful for game industry employees, but is not comprehensive enough to be considered a complete artistic education. The Bachelor of Education programme, within the Faculty of Education, offers study-units in Art. However, these classes are not primarily intended for industry application but focused on instruction at pre-University educational institutions and thus do not supply the level of expertise demanded by the digital game industry.

A number of study-units in the Bachelor of Communications degree programme provide instruction in digital design tools and concepts but these are of limited scope and do not provide a dedicated specialisation. This is understandable when one considers that the programme caters for a local market that, as discussed in section 4.1, requires more generalist workers than specialized ones due to reasons outlined above.

The Faculty of Media and Knowledge Sciences (MaKS), is further enhancing its offering with two new post-graduate programmes. Starting in October 2011, a new programme in Digital Arts will shore up the University's offering in digital media skills. Another post-graduate programme in Digital Game Development will be offered in collaboration with the Faculty of Information and Communication Technologies (ICT) and a European Institution specializing in game research and education. This new digital-games production Masters, starting in October 2012, will address higher-end jobs in the game industry such as game designers, game directors, producers and project managers.

The underpinning rationale at the University of Malta has been to provide a multi-faceted programmes at undergraduate level allowing for specialisations at the post graduate level. This approach has proved beneficial in terms of providing the Maltese labour market with a cadre of highly qualified and adaptable human resources willing and able to undertake multiple roles as the economy evolves. Such re-engineering has proved to be highly lucrative for a number of businesses and industries. Its potential is highly likely to be effective even for the digital-game industries that are willing to invest in Malta.

A list of courses provided by Malta University is provided in Appendix 4.2 Table 4.2b-i.

MCAST Art and Design

MCAST Art and Design has in the past years acknowledged the changing nature of the contemporary art world and the artistic skills that are required by industry. Although the MCAST Art and Design centre still offers courses in Fine Arts it is moving further towards digital media. This ongoing change is proving to be a big success and is clearly illustrated by the rising numbers of new intakes. The 2010/2011 Academic year saw a record intake of 635 students (a rise of over 220% from 2008) and numbers are expected to rise further for the 2011/2012 Academic year to an estimated 800 students.
This institution is proving to be popular with students because of the high rate of employability that can be found amongst those who graduate. MCAST Art and Design has successfully built various partnerships with the private sector and other institutions thus creating more widespread opportunities for its graduates. A breakdown of the various graduates would show that graphic design students are mostly employed by web design and marketing companies; 3D designers are employed as product designers and the fine arts students are taken up by different sectors as illustrators. All the other courses that are offered are also gauged towards finding a role in existing industries such as printing and media productions.

MCAST Art and Design's track record in addressing needs in the local job market make it a potential source of raw talent provision to an incoming games industry. Although MCAST Art and Design doesn't currently offer courses in game production; a glance at its prospectus shows that many credits and courses contribute to the artistic side of the games industry. A possible collaboration between MCAST Art and Design and the University of Malta could offer a course that would provide a good range of the necessary skills needed for the artistic side of game development. MCAST offers a hands-on approach to necessary technical skills whereas the University is strong on the conceptual side of the creative arts and critical thinking, all three of which are necessary in the game industry.
The approach taken by MCAST Art and Design is to offer courses at various levels; this allows a student to start from basic, foundational skills and continue to further their education and specialise in a creative field without the necessity of leaving the institution. MCAST Art and Design offers 6 Higher National Diplomas amongst which we can find 3D Design and Graphic Design[96]. All courses offer the same set of theoretical core credits but then each course provides the necessary specialised credits, most of which are practical in nature.

MCAST Art and Design offers a solid base of artistic skills at a level which is more than adequate for incoming game companies. These courses are not game-specific but there is an interest from MCAST to offer these in the near future. MCAST Art and Design has developed rapidly in the last few years and is set to move more seriously into the production of digital media in the near future, making it the ideal place to establish the foundational skills for the artistic side of game development.

[96] Please refer to the appropriate table to see all courses offered that are relevant to games production.

There is no doubt that MCAST Art and Design has come far in the last few years. Its development is however challenged by its ability to attract and retain highly qualified lecturers, primarily due to the limitations in wages it can offer. The salary scales Art and Design operates under are established by a collective agreement for the whole of MCAST. Whereas the University of Malta, and hence, Junior College, have seen a considerable increase in the salaries they offer across the board, MCAST has not enjoyed such a collective raise. There is also a lower cap on the possible qualifications MCAST can reward than the University of Malta. The lowest grade of lecturer at MCAST is an assistant lecturer with an annual salary of €19,000. The required qualification here is a Bachelor's degree. One step up from assistant, the lecturer grade is expected to have a Bachelor's degree and five years of experience, making €23,000 per annum. At the highest bracket is the senior lecturer 2 grade, making €28,000 and in possession of a PhD. Aside from competing with local industry and other educational institutions, MCAST Art and Design is trying to develop areas like interactive media, games and the digital arts that Malta lacks educators for. The most obvious answer to this challenge is importing competent educators from outside Malta. As we have outlined in 4.1 above, this is going to be necessary for Malta if it is serious in developing a digital games industry. But attracting quality teaching staff from abroad in digital design and games is going to be difficult with the salary scales MCAST Art and Design offers currently.

A salary comparison with foreign Art Schools that Art and Design needs to compete with in order to recruit qualified educators reveals the severity of the discrepancy in wages. In the USA, for example, Modelling Instructor earns between €26,000 and €56,000, depending on experience and qualifications. A concept artist instructor earns between €36,000 and €39,000 while an animations instructor earns between €47,000 and €63,000. The average salary for these positions is €44,000 as opposed to an average salary of €23,500 offered at Malta's prime artistic institution makes it immediately obvious that the local salary scales will not attract foreign experienced instructors to Malta's shores, at least not from the majority of Western Europe and North America.

A list of courses provided by MCAST Art and Design is provided in Appendix 4.2 Table 4.2b-ii.

MCAST Institute of Information and Communication Technology

> *To provide universally accessible vocational and professional education and training with an international dimension, responsive to the needs of the individual and the economy*
> MCAST Mission Statement

Recent Maltese legislation has proposed and put into action a strategy to align the Maltese educational system with the requirements of the contemporary work-place. As part of this initiative the government of Malta identified economic sectors where there was a shortage of a trained workforce. Following this the government directed educational institutions to own the role of providing forward looking education designed to meet the future needs of industry. The MCAST Institutes are part of this strategy. Each individual institute aims to adapt their courses to the current needs of the industries they cater for resulting in training that is more driven by the needs of the work-place than academic concerns.

In Malta's bid towards becoming an ICT Centre of Excellence one major obstacle was the lack of a broad pool of ICT workers. Since Malta has been trying to attract foreign ICT companies to set up in Malta, this talent gap proved to be problematic. Therefore one of the major tasks was that of developing a public education forum that would train students for the ICT industry. MCAST ICT was

one of the institutions that took up this role and nowadays is offering a selection of courses that are designed to prepare students for a career in IT.

MCAST has joined forces with BITEC (which is part of EDEXCEL)[97] to offer courses whose curricula have been designed by BITEC. These courses offer qualifications that are meant to be directly useable at the work-place and are recognized by educational institutions and by employers. The advantage of BITEC courses is that they are designed to cater for the needs of the economic sectors and to provide the type of qualities that are looked for by employers. BITEC does not offer any courses that specifically cater for games development, which presents an obstacle to MCAST ICT's desire to offer such courses. Although MCAST ICT is an independent body it must abide to the syllabi and individual credits that are designed and offered by BITEC since the institute emphasizes BITEC exam passes as a measure of success.

MCAST ICT deputy director Krasimir Andreinski explained that the range of courses offered by BITEC are a hindrance to the development of MCAST ICT for a number of reasons. First amongst these is the course selection and curricula are not designed with the specific needs of the Maltese education and industry, which differ greatly from those in the UK. Another problem is the selection of courses offered by BITEC does not necessarily match the teaching competencies locally and thus the course offering ends up being a patchwork of courses that do not necessarily complement each other in the best way possible. Finally, BITEC changes its curriculum and course offering every few years, which Andreinski felt was too frequent, resulting in a lack of consolidation of material developed and being generally a logistical nightmare for MCAST administration and teaching staff.

The biggest challenge that BITEC presents for MCAST ICT and games is the inflexibility it presents when new competencies are needed in the market, as would be the case with developing educational streams useful for the game industry. As BITEC does not allow for specific courses to be introduced and delivered at its partner institutions running the BITEC programme, it is improbable that the courses offered will be directly applicable to the game industry.

Another problem that Andreinski pointed out is the lack of entry requirements to join MCAST ICT and to progress from level to level. Students are coming into MCAST in droves but a good number of these do not have the basic knowledge to engage with the course content offered by MCAST ICT. Andreinski explained how certain students do not have the basic numeracy and literacy skills required to come out of MCAST ICT with practically applicable coding or networking skills (the two main areas that MCAST ICT offers courses in). MCAST ICT has a large student population, currently 1600 students, most of which lack the necessary basic skills straining the institutional and teaching resources to the detriment of qualified students with potential. According to Andreinski the quality of MCAST ICT students needs to increase drastically if more than a few students per cohort are going to be useful at the IT workplace.

The only way for MCAST ICT to be able to offer more useful courses to the Game Industry is by (a) designing and offering its own independent courses, possibly in conjunction with the University of Malta and (b) apply more stringent entry requirements, at least for its higher diploma courses.

A list of courses provided by MCAST is provided in Appendix 4.2 Table 4.2b-iii.

[97] "Edexcel, a Pearson company, is the UK's largest awarding body offering academic and vocational qualifications and testing to schools, colleges, employers and other places of learning in the UK and internationally." From http://www.edexcel.com/aboutus/Pages/AboutUs.aspx

St Martin's Institute of IT

St Martin's Institute of IT started operations in 1997 and is now a recognized provider of tertiary education in Malta. This institute offers a number of courses in the fields of business and management and in Information Technology. St Martin's Institute of IT is an Affiliate Institute of the University of London offering a portfolio of undergraduate diploma and degree programmes conferred by the University of London.

The institute offers a number of courses in IT that range from diplomas to a possible MSc. All the courses that are on offer provide the necessary knowledge and skills to anyone who wishes to join the world of ICT. Particularly relevant to game development is the Creative Computing BSc. The new Creative Computing BSc (Hons) degree which was introduced by Goldsmiths, the lead College of the University of London in 2006. The degree is structured in such a way as to offer an in-depth learning experience in the core aspects of design elements, and the cognitive reaction of humans to a wide spectrum of design, be it visual, audio or experiential. Students are exposed to the creative aspects of computing, and encouraged to propose new methods of creative interaction between user and machine.

The main focus of the creative computing degree is versatility. Students are encouraged to develop original solutions to creative works and hand these in as part of their final thesis. This allows each student an aspect of freedom to specialize his or her studies in main areas of personal interest.
The academic content of the degree is supplemented with a number of practical workshops and initiatives. One of these is the Creative where students are given a week of focused effort to develop a technology-based unique blueprint for an unresolved problem. Another such initiative is the Games Development Challenge which offers a set of workshops for students that train students to develop a digital game in a 5 month development cycle. The workshop includes soft skills such as project management, team building and human resources issues, as well as hard core skills such as programming, platform versatility, digital art and branding. St Martin's has also plans to focus on research game AI in the near future.

St Martin's also provides extra-curricular activities for students interested in the production of short films. The focus here is on script writing, production, cinematography and marketing. Some of these skills overlap with the game development and thus aid in the process described above.
The Institute is expanding its existing entertainment technology centre with the acquisition of both hardware such as a Sony PSP development kits, Xbox with Kinect console kits, as well as licenses for games development engines such as Crytek and Unity Development platform.

As Theuma explained, one of the challenges that St Martin's faces at the moment is the need to develop its teaching staff further in order to be able to offer post-graduate degrees. The majority of staff currently hold only a Bachelor's degree, but most are eager to develop further academically.

Another challenge faced by St Martin's is that currently it cannot award degrees locally but is trying to partner with UoM to overcome this and start offering a joint MSc. Theuma explained how St Martin's is eager to foster a closer collaboration with the University of Malta in the near future.

St Martin's vision is to be a boutique university that delivers high quality courses to small groups of students oriented towards the latter's need in the domain of ICT. Its current offering aims to provide an educated and trained work-force in ICT and the creative sciences that addresses both the needs of incoming industry as well as fostering local game companies to establish themselves with the aid of the mentoring provided during the Gamedev Challenge. In the words of the institute's director,

Charles Theuma, St Martin's aims to bring together creativity and IT to create graduates that are "technically competent and creatively professional".

A list of courses provided by St Martin's is provided in Appendix 4.2 Table 4.2b-iv.

Holistic Institute of Technologies

Holistic Institute Of Technologies has been in operation since 1995. It offers a variety of I.T. courses at diploma level ranging from ECDL Core, ECDL Advanced, Web Design, Web Programming, PC Technician, Programming languages (Java, C++, C#, SQL, ASP).

In these last 3 years Holistic has also launched courses in robotics and games development. Simon Bonanno, the director of Holistic Institute of Technologies, found a gap in the range of courses offered locally in the form of video game education. Holistic thus partnered with TIGA and launched a set of game courses aimed at various levels. For the younger cohort of students Holistic offers a Kodu course. Kodu is a new visual programming language made specifically for creating games. It is designed to be accessible for children, but can be enjoyed by anyone. The programming environment runs on PC and Xbox, allowing rapid design iteration using only a game controller for input. Holistic embarked on launching these courses since it felt such skills would be in demand in the near future.

Holistic also offers Microsoft XNA courses. XNA Game Studio 4.0 is a programming environment that allows students to use Visual Studio to create games for Windows Phone, the Xbox 360 console, and Windows-based computers. XNA Game Studio includes the XNA Framework, which is a set of managed libraries designed for game development based on Microsoft .NET Framework.

The last course offered is the TIGA designed Train2Game course. This course is delivered mostly on-line with students working with professionals in the game industry selected by TIGA while having local access to toolkits and resources required by the suite of courses. The diploma has been designed with game industry professionals and is meant to be very practical in nature, thus preparing students for entry level game industry jobs.

Holistic also offers basic courses in programming and graphic design to equip students with basic skills before embarking on the gaming diplomas.

A list of courses provided by Holistic Institute of Technologies is provided in Appendix 4.2 Table 4.2b-v.

STC Training

STC started off as a training centre for large IT projects primarily servicing MITA[98]. It was owned by the Maltese Government, HSBC and BOV along with other shareholders, but eventually the latter bought out the rest and STC became independent. It currently offers a BSC from Middlesex University and a number of diploma and vendor courses. STC is looking at expanding its collaboration with Middlesex University in the near future. STC currently has 420 students enrolled in its various programmes.

The courses offered by STC are mostly geared towards industry and the majority of teachers have industry experience or are still industry professionals.

CEO, Patrick Pullicino, explained how STC Training has always been in close contact with the industry

[98] Originally founded as the Management Systems Unit (MSU)

in order to respond to rising needs in the supporting educational infrastructure. Patrick explains how 82% of STC students find employment after 1 year of graduating and 86% find employment thereafter.

Following a considerable demand from students for game courses, STC is going to offer a number of standalone modules at diploma and 1st year undergraduate level in game related subjects including: digital design and illustration, 3D graphics and animation, sound production and game development. All these are going to be given with games in mind.

All courses offered in conjunction with Middlesex University are designed and audited by Middlesex University. STC is working with Middlesex University to establish a branch of Middlesex locally which will service primarily British students enrolling at Middlesex UK directly.

Pullicino, explained that if Malta is to establish a digital games industry it requires a serious investment in competencies first, which he finds gravely lacking both on the creative and the high-end programming side.

A list of courses provided by STC Training is provided in Appendix 4.2 Table 4.2b-vi.

4.3 Current Video Game Landscape

To date, Malta has not capitalized on the social, cultural and economic value of the video game wave that has taken the world by storm in the last decades. Although game systems have, since their inception, been popular among Maltese players and thus the country has a solid gaming population, game development, even in the more basic garage forms, has never taken off on the island.

Table-top RPGs and war games had a foothold on the island from the mid 70s, with a sizeable and healthy gaming club being established even before Dungeons and Dragons launched. This group, now in their fifties, spawned a number of talented pen and paper scenario and game designers, some of which have published their products in various venues abroad. None of these have translated their work to the digital format, however.

In the video game landscape the island is full of avid players, but from what we gathered from speaking to game communities, there is very little, if any, mod or garage development going on.

The recently established Digital Games Initiative ran a number of game related events including workshops, seminars and a business forum, which saw a great interest from the public, with all the events packed beyond capacity. The Digital Games Initiative, run by the University of Malta, also started the Gamezing competition, targeted at amateur game-makers from various institutions, attracted a number of teams to attempt to develop simple games on various platforms. The 2010 edition was a success and the 2011 edition has just been announced and it launched with a strong 90-person turnout at the launching event.

4.3.2 Gaming Community in Malta

We end this section with a note about the gaming community in Malta. As part of our investigation of local skills in game development we contacted a number of members from the local gaming community to try and root out any garage developers or mod designers that might be available to incoming companies or that could be the seed of future game companies. Although we might have

missed some that are not connected to the larger game communities, we did not find any substantial source of garage development. It seemed appropriate, however, to give an overview of the local gaming community, as these would be the most likely people to be interested in game development should courses and companies establish in Malta.

The Maltese game market is dominated by PC gamers. As in other parts of the world, a larger number of people who do not consider themselves gamers still dedicate a number of hours per week to casual games. Some of the most popular are the free games offered on Facebook, like Farmville, Mafia Wars and Casino City. These games are viewed by many as easy and don't require too much thought and skill, therefore being viewed as the perfect form of relaxation. On the other hand they also attract many players because of an element of competitiveness and in some cases entrepreneurship. Apart from these elements what makes the most popular is probably the social aspect of these games since one gains resources by adding friends and making friends participate in the venture. The fascinating aspect of these games is the fact that a large number of PC users who do not consider themselves as 'gamers' tend to spend a large number of hours of play time and will even change their daily routine so as to fit to some game requirements like crop harvesting in Farmville.

The other most common type of game that is played by a large segment of PC users, who are only casual gamers, are games downloadable or unloadable for free from the internet. Most the times these are classic titles like Pac Man or Space Invaders which have remained very popular. One can also find short games that can be enjoyed in the space of a quick 'office break' or 'study break'. Arguably these same people are also the majority of people that also make use of mobile games and apps.

The majority of players who consider themselves gamers mostly opt for first person shooters with the Call of Duty series proving to be the most popular especially the Black Ops edition. The number of people who regularly played MMORPG's like World of Warcraft have switched to first person shooters because of the investment of time needed by the latter. Many people have found that games like WOW would take up too much time and couldn't afford to do so because of work or study. Another factor is that because of Malta's climate and social life it is infrequent for people to spend long hours at home without going out at all, this also limits the amount of time dedicated to game-play.

Up to two to three years ago LAN cafes were very popular amongst local players especially the younger generations. These centres offered the opportunity to a number of players who couldn't afford their own gaming rig. LAN cafes were also the focus of the social side of local acting as a meeting point for gamers and organizing a series of tournaments throughout the year. The number of LAN cafes has been decreasing and many have run out of business, the main reasons being the higher costs of maintaining the business (especially electricity and maintenance costs) and the fact that more and more people can afford gaming machines due to more accessible prices in the recent years. These factors have also led to a decline in the number of LAN tournaments being organised in Malta and Gozo.

The gaming community is mostly active in some online leagues but most local players prefer playing in international leagues where the number of players is much higher than in the local ones. There are also Maltese dedicated gaming servers, which were very popular in the past (particularly during the Counter-Strike era), but are also losing their audience. Most players prefer making use of foreign servers (mainly continental Europe) because there are many more players available to play against and also because they offer a larger selection of mods and game variants.

Although gaming has been popular in Malta for a very long time there seems to be a lack of players that have engaged in mod creation. There have been some attempts for some low profile games but in general most players are satisfied with using the available scenarios and mods especially when it comes to more popular games like Call of Duty.

4.4 Supporting Industries

Translation Services

Due to its location and history Malta can boast that a large portion of its population is either bilingual or multilingual. This quality has been developed further because of Malta's dependence on Tourism and partially by the growth of EFL (English as a Foreign Language) teaching as a new service industry. Arguably one of the reasons why Malta has been popular with the establishment of foreign companies on the island is this availability of a local workforce with multilingual abilities.

After Malta joined the EU in 2004, Maltese became one of the official languages of the EU, which meant that all official documents and texts issued by EU Institutions had to be translated in Maltese too. This meant that there was a boom in translation services and that more and more people had to be employed in this growing industry. Most of the people that have opted to work in this field were either employed by EU institutions or else by translation agencies and translation companies, either as freelancers or as in-house translators.

On the other hand Malta also offers translation services in various languages apart from Maltese and English and these services are mainly offered by translation agencies who recruit and employ freelance translators from around the globe. Some companies like certain law firms have also started offering limited translation services in a few languages and restricted to one specific field (e.g. law). Apart from these there are some larger companies that have seen translation services as a great business opportunity especially as a business to business service. These companies offer translation services in various languages that are targeted to specific industries like the pharmaceutical or financial sector.

Just as these companies have managed to target some of the newly established industries that are developing in Malta, this could repeat itself with the establishment of new business ventures like digital games production.

A list of companies providing translation services is provided in Appendix 4.4 Table 4.4-i.

Customer Support Centres

Call Centres and Customer Support services started moving to Malta in 2005 and Malta Enterprise was quick to understand the potential of this new business and by 2006 was working hard to try and attract even more companies to Malta.

Malta's main selling points were Its geographical positioning, Its EU membership and most importantly its human resources. Very few countries can offer a labour force that is largely bilingual and in most cases multi lingual. Malta Enterprise had identified that 88% of Maltese people were fluent in English, 66% in Italian and 17% in French. We must also add that 68% of the population

can have a conversation in 2 foreign languages and 23% in 3 foreign languages[99]. Apart from these aspects Malta also offered various tax incentives and financial benefits to attract these businesses.

The biggest Call Centre and also the biggest success for Malta is the HSBC Call Centre in Swatar which employs over 500 employees (mostly full timers). The HSBC Call Centre has registered a steady growth in business since it started its operations in Malta and it also offers competing and advantageous remuneration and benefits to its employees. Excluding remote gaming companies in Malta we find around 1,000 people working in the Call Centre Industry, including full timers and part timers[100]. However we also find that there is also a high turnover of employees which is a direct result of the tedious and 'boring' nature of the job[101].

The remote gaming industry in Malta employs over 2,000 people mostly employed in customer support or help desk. Because of the nature of their business and because most of their markets is in non-English speaking countries many remote gaming companies have a tendency of only employing 'native' speakers which results in non-Maltese being employed for the roles. Fluency in a language is not considered enough of a requisite. On the other hand it must also be noted that since most customer complaints come through e-mail, many companies make use of translating software as a means of communicating with their clientele.

Most people who work in customer support roles prefer the remote gaming industry against other industries because of the higher remuneration and because the nature of the job itself is preferred. In a Call Centre environment most complaints and problems are tackled over the phone whilst in remote gaming these are done through emails, it is obviously much easier to deal with problem clients the latter way.

A list of companies providing support services is provided in Appendix 4.4 Table 4.4-ii.

Legal Services

Malta has a high quota of lawyers per capita which means that professional legal services are highly accessible and that there is a large selection of legal firms. Traditionally, legal firms were small, family-run firms that would often specialise in the criminal and civil courts. Today the nature of legal services has changed drastically and there is a growing demand in other aspects of law: European, financial, corporate and new aspects like e-commerce. Today the nature of firms has changed to a more corporate one where a number of lawyers are employed, so that an ever-increasing number of specialised services may be offered to their clientele.

The change in the services offered by legal firms is also a reflection of the growing demands of a changing economic structure. Today we can find a number of legal offices that are specialising in particular fields that are directly linked to a particular industry. A number of lawyers have specialised in gambling laws and remote gaming laws to offer their services to the remote gaming companies that can be found in Malta. A growing number are working in the field of financial law and cater for

[99] The information was taken from Call Centres Malta, A Malta Enterprise Publication, September 2006. http://www.maltaenterprise.com/documents/CallCentresMalta-English_001.pdf

[100] Stats and information were extracted from a report commissioned by ETC from Gatt and Partners, Research Study on Call Centres in Malta and Gozo, September 2008.
http://www.etc.gov.mt/docs/Call%20Centre%20Research%20Report%20finalised.pdf

[101] Since in our study we were interested in the number of employees found in this industry we opted to ignore those companies like Fraser Eagle Group who are registered with Malta Enterprise but not with ETC.

the growing sector of financial services in Malta. Many legal firms are also dedicating part of their efforts to advise on intellectual property law and art law; this is happening to fulfil the needs of the growing creative industries in Malta and abroad.

Any foreign company that would be interested in opening an office in Malta can easily find all the legal services it would need from the same firm. From starting off the business to any other needs like copyright laws, an enterprise may make use of one stop shop type of firms that can also boast international experience and affiliations.

Accountancy Firms

Accountancy firms in Malta are legislated and regulated through the Accountancy Board which is part of the Ministry of Finance, the Economy and Investment. The Accountancy Board was founded in 1979 through the adoption of the Accountancy Profession Act, Chapter 281 of the Laws of Malta. This board is responsible for:

- the issue of accountants' warrants and auditors' practising certificates after making their recommendations to the Minister of Finance, the Economy and Investment;
- the registration of partnerships of accountants and auditors;
- keeping a register of the above;
- dealing with cases leading to the suspension or withdrawal of warrants or practicing certificates;
- advising or making recommendations and expressing its views to the Minister; and
- such other functions arising from any law or as may be delegated to it by the Minister under the Accountancy Profession Act.[102]

Accountants and accountancy firms are highly regulated[103] and monitored thus ensuring that enterprises and investors are safeguarded from bad practices and irregularities.

Amongst a large number of local accountancy firms, Malta also hosts a number of international companies (or members) that may rely on the expertise of both local and foreign offices and consultants. Added to that many accountancy firms have identified the importance of FDI and the set-up of international companies towards Malta and therefore play an important role in the promotion of Malta as an investment opportunity. On their behalf these firms also offer all the necessary services that prospective investors might need in order to locate in Malta.

A list of companies providing legal services is provided in Appendix 4.4 Table 4.4-iii

Web Developers

Many locally based web developing companies have identified the need to offer more than just a web site to their customers. Enterprises view a website as only part of a marketing and promotional package that is needed if they want to be successful. SMEs and even larger organisations will therefore need the services of a company that can create that package and offer them the ability to create a specialised branding product that would be difficult to create on their own.

[102] Quoted from the Ministry of Finance, the Economy and Investment website; http://finance.gov.mt/page.aspx?site=mfin&page=ab

[103] To work as accountants, individuals must also be members of the Malta Institute of Accountants who also helps the Board to regulate and monitor accountancy practices.

Web Developing companies today offer all types of web solutions as part of the services they render, but also offer the possibility of a one-stop-shop for all branding and promotional material. Some of these companies also offer other services like web hosting, server hosting and data centres.

Maltese web developing companies rely on teams of designers and creative consultants that work together in order to create an overall product that incorporates a brands image and the corporate identity of their customer. These companies have managed to gain renown beyond the shores of Malta and are expanding their portfolio to include more services and expertise including professional film and photography.

A list of companies providing web development services is provided in Appendix 4.4 Table 4.4-iv

4.5 Logistics and Finance: Transport, Business Support, Office Space and Fiscal Incentives.

4.5.1 Transport: Frequency and Ease of Access to Malta.

Malta offers direct flight connections to most European destinations but for long-haul flights one has to opt for the use of connections either from Dubai; if going towards Asia or from London; if going towards the Americas. The latest Air Malta reforms has reduced the range of direct flight options and many Eastern European destinations previously directly serviced by Air Malta now require connecting flights via Munich or Frankfurt.

A number of low cost airlines now operate to and from Malta and as time passes they are adding more destinations. Although these companies may offer services at a reduced price their flight times are often restricted.

Air Malta and Lufthansa offer a regular service at an accessible price. Lufthansa only fly from Malta to Frankfurt or Munich, all other destinations (including other German destinations like Berlin) require and a connecting flight and sometimes a stopover.

Emirates offer a service towards the eastern part of the Mediterranean to destinations like Cyprus. They also offer a gateway to Asia, connecting via Dubai.

Typical flight costs from Malta to worldwide games clusters are given in Appendix 4.5 Table 4.5-i.

4.5.2 Office Space and Location

Due to the influx of iGaming companies in Malta a number of established estate agencies have geared up to cater for office rental in new ways. Traditionally this was a slow moving market on the Maltese islands. Today estate agencies have dedicated office letting teams that specialize in letting of residential and commercial office space to incoming employees and executives and have also started offering complete relocation packages.

Commercial office space has improved over the last few years. The iGaming sector, Financial Services, IT, Research Companies, along with a number of other industries created the demand for open-plan modern office buildings which were not common in Malta prior to the influx of these companies. This increase in demand for large, open-plan office space caused property developers to build large, state of the art, office space.

The areas where sizeable, modern office space is most commonly available are rather sharply

defined: the coast opposite Valletta starting from Msida through Ta Xbiex, Gzira up to Sliema and ending in St Julians contain the vast majority of iGaming companies.

In future the exciting developments at the Corporate Business Village and the Airport Business Centre will offer space to games companies.

Although the capital, Valletta, houses a large number of public sector offices and other businesses, the buildings are older in style and thus are limited in configuration and size. Open plan offices there are rare.

Outside of these central areas there are a number of cheaper offices, but these are not as common or as desirable as the Sliema coast with proximity to attractive residential property that enjoy sea-views, a bustling promenade and easy access to numerous restaurants, cafes and clubs. The Gzira to St Julians coastline is the hub of Maltese nightlife and tends to attract the majority of incoming foreigners, particularly if these are in their late teens, twenties and early thirties. There are a number of other options including Attard, Lia, Balzan, Naxxar, San Gwann and Mosta.

Serviced offices are a recent addition to the commercial letting world in Malta. Until recently these were few and far between, but in recent years their presence is in on the rise. They are still, however, much less common than in comparable cities around Europe. Serviced offices in central areas, especially in smaller configurations, are very expensive, at about triple the cost of a standard office in a similar location. As detailed already in the report Malta is in strong need of a small business incubator / hot desk location of a similar type to TechHub in London. This location would be suitable for IT related and creative companies beyond games also.

Another option for incoming companies is the Smart City Complex in Ricasoli. Smart City is a joint venture between TECOM Investments, a member of Dubai Holding, and the Government of Malta. The Smart City buildings are some of the most technologically advanced office buildings on the island and as development on the site grows and more companies move into the complex, Smart City is set to become a major IT hub in Malta. Smart City is located at Ricasoli and will cover an area of 360,000 square metres along the picturesque coast. Smart City will offer offices, residential apartments and retail spaces, along with leisure, entertainment and hotel establishments. The offices offered by Smart City are flexible and easily configurable. The main issue currently is the remote location of Smart City. Although Malta is small enough that distances and commute times are not a major issue, the lack of the exciting nightlife, range of restaurants, cafes and general bustle of the Sliema/St Julians area may make residing near Smart City unattractive for incoming foreigners, while getting to Smart City from these areas would add considerable travel time, about an hour during morning and afternoon rush hours by car and longer than that by public transportation.

Deposits paid on such properties vary greatly from property to property but the most common deposit given is of a single month. The length of the lease also varies greatly depending on the specific agreement between landlord and tenant, but generally is of at least a year or two.

Typical office rental prices as at the time of writing are given in Appendix 4.5 Table 4.5-ii

4.5.3 Business Support

In its bid to try and attract more private investment towards Malta and to encourage private enterprise the government of Malta has tried to eliminate as much bureaucracy as possible and create clear guidelines and regulations for locating in Malta.

One of the Government's primary goals in the past years has been to establish a business environment, which is conducive to entrepreneurship. Part of this effort is being directed at ensuring that administrative and bureaucratic burdens faced by new start-ups initiating their business activities is alleviated. Furthermore, the Government has been committed to creating a single venue that sees to all set-up needs and requirements whilst ensuring that business set-up was quick and with the minimal fees possible. The proposal therefore to set up a Business Facilitation Centre was endorsed by Cabinet and highlighted in the 2007 Budget and Business First is now launched and is fully operational and fulfilling this role.

Malta Enterprise has assumed the responsibility of setting up a Business Support Centre (BSC) for enterprise in Malta, which BusinessFirst has been established to do. The BSC is to serve as a central contact point for businesses, in some cases acting as an intermediary between the business and the different Governmental bodies. Most formalities and procedures for the setting up of a business can be conducted within the BSC.

Based on what has been outlined, the Business Support Centre (BSC) will therefore encompass three important functions:

1. Act as a centre for business start-ups

The BSC will provide the initial information that someone setting up a business would require. Such information would include fees, application forms that need to be compiled, documentation and information required and an indication as to which Government body is responsible for the issuance of the relevant license and/or permit.

The BSC will also act as a single venue through which a person setting up a business may obtain all the necessary services for setting up the business required including company registration, VAT and Inland Revenue registration, employment registration, filing for the required licences and/or permits to operate the business.

2. **Act as a business support centre which offers holistic support to business**

Malta Enterprise offers a wide array of services, incentives and schemes based on the business activity and the legal entity in question. The BSC will therefore be offering these services to promote business generation in Malta, whilst providing support in business management for the expansion and internationalisation of their business activities.

3. Act as a point of single contact, an EU requirement under the Services Directive

The objective of the Services Directive was to release the untapped growth potential of services markets in Europe by removing legal and administrative barriers to trade in the services sector.

The Directive requires each Member State to simplify procedures and formalities that service providers need to comply with. In particular, it requires Member States to remove unjustified and disproportionate burdens and to substantially facilitate (a) the establishment of business or where a natural or legal person wants to set up a permanent establishment in a Member State, and (b) the cross-border provision of services or where a business wants to supply services across borders in other Member States, without setting up an establishment there.

Through L.N. 495 of 2010, Malta Enterprise was also given responsibility to address parts of the EU Services Directive in implementing the removal of barriers for service providers to establish their business in another Member State as well as provide cross-border services. The creation of a 'Point of

Single Contact' (PSC), came into effect, whereby electronically, one can not only obtain necessary information relating to the business s/he wants to set up in another member state but also apply for the obligatory licences/permits to set up and trade effectively.

An overview of areas of support provided by Malta Enterprise is given in Appendix 4.5 Business Support – Malta Enterprise.

4.5.4 Fiscal Incentives and Development Schemes

4.5.4.1 Fiscal Incentives

Malta's corporate tax regime has evolved over the years to a highly sophisticated system which has combined an interesting blend of realistic corporate taxation together with a series of favourable tax credit incentives. Today, Maltese companies have one of the most tax-advantageous corporate structures within the European Union because Malta operates a full imputation system on tax. This allows for no further tax to be due by non-resident shareholders on receipt of dividends distributed out of profits of a company. These distributions may also trigger refunds of Malta tax paid by the company. The standard refund is 6/7ths of a 35 per cent corporate tax rate. The effective tax rate will generally range from 0% to 5%.

Some Tax Highlights

Residence: A company incorporated in Malta is considered to be resident and domiciled in Malta. A company incorporated outside of Malta is considered to be resident in Malta only if the management and control of its business is exercised in Malta.

Rates of tax: The standard rate of tax on income and chargeable gains is 35% (in line with the highest personal tax rate) - flat rates of tax are payable, by way of exception, on certain categories of income such as investment income, certain transfers of immovable property in Malta. The amount of tax payable by a company may be reduced via various forms of double tax relief, such as the Flat-Rate Foreign Tax Credit providing relief at a rate of 25%.

Malta operates a full imputation system of taxation: When a company distributes dividends out of profits on which it had paid tax, no further tax is due by the shareholders and a credit for the tax paid by the distributing company is available to the shareholders.

Allocation of profits: Companies are to allocate distributable profits to one or more of 5 tax accounts, depending on the nature/source of the profits: Foreign Income Account (FIA), Maltese Taxed Account (MTA), Final Tax Account (FTA), Immovable Property Account (IPA), and Untaxed Account (UA).

Tax refunds: Distributions of profits from either of the FIA or the MTA trigger refunds of Malta tax paid by the company. The effective tax rate after refund will generally range from 0% to 10%. The standard refund (e.g. generally for business profits) is 6/7 of the Malta tax (grossed up with any relieved foreign tax – subject to certain conditions – in relation to the MTA), going up to 100% in the case of profits derived from a participating holding and down to 5/7 on profits derived from passive interest and royalties (income from royalties are tax free). Where the company has claimed double tax relief on profits allocated to the FIA, a tax refund of 2/3 of the Malta tax paid (grossed up with

any relieved foreign tax – subject to certain conditions) on the distributed profits may be claimed. Tax refunds are Malta tax exempt and payable within a statutory 14 days.

Non-resident companies' branches: A non-resident company with a Maltese branch may allocate the profits from the branch activities to the various tax accounts, thus enabling the company's shareholders to operate the tax refund regime.

Participation Exemption: Income deriving from a participating holding (generally a 10% equity holding or partnership interest – there are alternative tests) in a non-resident entity or from the disposal thereof are exempt from tax (alternatively they may be taxed at 35% and the shareholder may, following distribution, claim a full refund of the Malta tax paid by the company thereon) – subject to certain anti-abuse provisions being satisfied. Similarly, where a two-tier Malta corporate structure availed of, any gains realised upon the disposal of the underlying entity may likewise benefit from the Participation Exemption. Malta's holding company regime may thus offer an effective Malta tax rate of 0% either through the workings of the tax refund regime or, alternatively, at the level of the holding company through the Participation Exemption.

Withholding tax (WHT): There is no WHT on outbound dividends and no WHT on interest or royalties payable to non-residents (subject to certain conditions being satisfied).

Anti-avoidance rules: There are some general anti-abuse provisions. There are currently no thin capitalisation, transfer pricing or controlled foreign companies rules in force.

General: (a) no duty/tax is levied on the issue of shares; (b) duty exemptions relative to transfers of marketable securities may be obtained; (c) there are no wealth or capital taxes in force.

Personal taxation

Basis of taxation: Persons ordinarily resident and domiciled in Malta are subject to income tax in Malta on their worldwide income and some chargeable gains. Persons who are resident or domiciled but not ordinarily resident and domiciled in Malta are chargeable to tax in Malta on (a) income and chargeable gains arising in Malta, (b) income arising outside Malta and remitted to Malta.

Double tax treaties: Malta has entered into in excess of 50 (largely OECD based) double tax treaties including with most major European trading nations, the US, Canada and China.

Rates of tax: Individuals are charged to tax at progressive rates of 0%-35%. A reduced flat 15% rate on remitted foreign sourced income (capital gains being exempt) is available to certain residence permit holders. This flat rate of 15% income tax is being extended to a specified, yet wide, selection of roles within the game industry including game industry managers, programmers, designers and quality assurance, among others. This extension has been approved in the 2011 budget and is being implemented at time of writing.

Participating Holding Tax Regime

The Participating Holding tax regime, first introduced in the mid-1990s, has evolved over time and is an EU approved regime. It is available to a resident holding company in relation to equity holdings or partnership interested – which need not be held by the holding company by way of investment primarily in non-resident entities with respect to:

a) An equity holding in a non-resident company and an interest in a non-resident partnership akin to the Maltese partnership en nom commandite, the capital of which is divided into shares.
b) An interest in a non-resident body of persons of a nature similar to the Maltese partnership en nom commandite, the capital of which is not divided into shares, where the interest so held entitles the holding company to a right to votes, to profits available for distribution and to assets available for distribution upon the winding up of the body of persons concerned.

The 'holding' should grant the holding company any 2 of 3 rights, namely a) a right to vote, b) a right to profits available for distribution, c) a right to assets available for distribution on winding up of that entity.

The equity holding or partnership interest in the non-resident entity concerned must satisfy at least 1 of the 6 tests set out in the definition of 'participating holding' in the Income Tax Act (Chapter 123 of the laws of Malta – the 'ITA'):

(i) having a direct holding of at least 10% of the equity; or
(ii) having a holding of equity combined with an option to acquire the balance of the shares; or
(iii) having a holding of equity combined with a right of first refusal in relation to a proposed disposal, redemption or cancellation of shares; or
(iv) having a holding of equity combined with a right to sit on that entity's board or nominate a person to sit on said board; or
(v) having a holding of equity by way of an investment of at least €1,164,000, where that investment is held for an uninterrupted period of at least 183 days; or
(vi) having a holding of equity for the furtherance of its own business and where said holding is not held as trading stock (in practice, rarely availed of).

With effect from 1 January 2007, the Participating Holding regime is only available with respect to dividends (including partnership distributions) derived by the non-resident entity from a participating holding if at least one of 4 'safe harbours' are satisfied:

(i) if the non-resident company / partnership is incorporated or resident in another EU Member State; or
(ii) if the non-resident company / partnership is subject to any foreign tax of at least 15%; or
(iii) if the non-resident company / partnership has less than 50% of its income derived from passive interest or royalties e.g. engaged in business or deriving dividend income or gains; or
(iv) if the holding in the non-resident company / partnership is not a portfolio investment, where the non-resident company / partnership or its passive interest or royalties have been subject to any foreign tax of at least 5%.

Tax refunds – Option 1: Distributions of profits by resident holding company from either of the FIA or the MTA trigger refunds of Malta tax paid by the resident holding company ('MaltaCo'). The refund in the case of a distribution of profits derived from a participating holding shall be equivalent to 100% of the Malta tax paid by MaltaCo on the profits in question. Accordingly, following a full distribution of taxed profits deriving from a participating holding, the effective Malta tax rate after refund in relation to profits derived from a participating holding may be reduced to 0%. Tax refunds are Malta tax exempt.

They are payable in the same currency as that in which the share capital of MaltaCo is designated and they are payable within a statutory deadline of a few weeks. No withholding taxes shall be levied

by MaltaCo on any dividends so distributed. Said dividends shall not be subject to any further Malta tax (subject to certain conditions).

Participation Exemption – Option 2: Income in the form of dividends or capital gains derived by MaltaCo from a participating holding are, at the option of MaltaCo, exempt from tax in Malta in MaltaCo's hands. It is important to note that as from 2010, where a two-tiered Maltese company structure is in place, any gains realised upon a disposal of the underlying company may also benefit from the Participation Exemption.

These exempt profits shall be allocated to another tax account of MaltaCo, namely the Final Tax Account. Subject to certain conditions, no withholding taxes shall be levied by MaltaCo on any dividends distributed from its Untaxed Account and said dividends shall not be subject to any further Malta tax.

Tax Exemption on Royalty Income from Patents

Malta Enterprise is currently administering the fiscal incentive dealing with royalty income from Patents, enacted in 2010 under the Income Tax Act (Cap 123 of the Laws of Malta which is the parent Act).

The incentive extends the rule on exemption from income tax, under Article 12 of the Income Tax Act. Royalties and similar income derived from patents in respect of inventions, whether in the course of a trade, business, profession or vocation or otherwise, are exempt from income tax, subject to conditions establishing minimums etc.

The person applying for the exemption must have carried out, either solely or together with another person or persons, research, planning, processing, experimenting, testing, devising, designing, developing or other similar activity leading to the invention which is the subject of the qualifying patent.

This applies to 'qualifying patents' which are patents, registered in Malta or elsewhere, in relation to which the research, planning, processing, experimenting, testing, devising, designing, developing or similar activity leading to the relevant invention was carried out in Malta or elsewhere.

The incentives cover 'royalties and similar income' which include any sum paid for the grant of a licence to exercise rights under a qualifying patent.

Where any income which is so exempt from income tax is derived by a company, the distribution of the particular profits by way of dividend by such company shall also be exempt from tax in the hands of the shareholders. Where the person in receipt of such dividend is itself a company ('the second company'), any dividend paid to the members of the second company shall, to the extent that such dividend is paid out of profits which are exempt in terms of this incentive, not be charged to tax under the Income Tax Act, and where a member of the second company is again a company, this shall apply as though references to the second company were references to that member.

When applying to Malta Enterprise to benefit from this incentive, an applicant must confirm that:

i. the income is generated under market conditions and at arm's length when related undertakings are involved;

ii. the licensor paying royalty fees is using the licensed knowledge in a productive economic activity;
iii. the patented knowledge/invention was the result of research;
iv. the applicant is not defaulting on VAT, Income Tax, Social Security and rent payments to the Government.

Research and Development – Tax Credits

Malta Enterprise is an Intermediate Body (IB)1 responsible for administering six European Regional Development Fund (ERDF) Grant Schemes under the 2007 – 2013 programming period. These include:

i. International Competitiveness – to support enterprises in their market penetration efforts;
ii. Innovation Actions Grant Scheme (Innovation) – to support SMEs develop innovative processes, products and services;
iii. Innovation Actions Grant Scheme (Environment) – to assist SMEs improve their environmental performance;
iv. Small Start-up Grant Scheme – to facilitate the setting up and growth of small start-up enterprises;
v. e-Business Development Grant Scheme – to assist SMEs propagate the use of ICT in their daily business operations;
vi. R & D Grants – to assist enterprises invest in industry driven research projects to be in a better position to develop new products and processes.

The R&D incentive provides grants to enterprises carrying out Industrial Research and Experiential Development activities leading to the development of new or significantly improved products, processes or services. Experiential Development means acquiring, combining, shaping and using of existing scientific, technological, business and other relevant knowledge and skills for the purpose of producing plans and arrangements or designs for new, altered or improved products, processes or services.

Costs are eligible as long as they are incurred in relation to an approved project. Such eligible costs would be:

i. Personnel costs – wages of researchers and technicians are eligible;
ii. Instruments and equipment – cost of new instruments and new equipment;
iii. Contractual research, technical knowledge and patents – cost of contractual research, technical knowledge and patents bought or licensed from outside sources at market prices, consultancy costs. These costs may not exceed 25% of the total project cost;
iv. Material, supplies and similar products – bought specifically for the project and incurred directly as a result of the research activity.

Supported R & D projects cannot exceed 36 months to be completed and all eligible costs must be incurred within this timeframe. For an application to be considered for co-funding, a minimum project value (based on eligible expenses) of at least Euro 60,000 is required.

The current guidelines are active until the 31st December 2013. The guidelines state that assistance under this scheme shall not be provided to undertakings engaged in the gaming industry, however it is interpreted this would not apply to video game development, but instead to iGaming.

Registration of Intellectual Property Tax Credit for SMEs

Another Malta Enterprise incentive, this is aimed at Small and Medium sized Enterprises who have already conducted an approved Industrial Research or Experimental Development project. The tax credit covers costs incurred in the 24 months after the previous project has been completed and takes into consideration:

i. Costs preceding the grant of the intellectual property right relating to application;
ii. Translation costs in other jurisdictions;
iii. Costs incurred in defending the validity of the right during the application procedure.

4.5.4.2 Development Schemes

Malta Enterprise has created a number of incentives to help different types of SMEs to continue to develop and improve their business activity. Many of these initiatives may be applicable companies who offer services to new incoming industries like Games Production where innovation and development is the key to success. This new industry could offer new opportunities to local SMEs who want to tap into the sectors of ICT or Creative Industries.

Listed below is a selection from the initiatives ME offers to local SMEs and that could be used by local enterprises that offer services to, or become part of, the Games Production Industry.

Loan of highly Qualified Personnel

Small and Medium Enterprises (SMEs) can benefit from the temporarily engaging highly qualified experts to work on R&D&I projects. In this way SMEs can access new knowledge and increased innovation capabilities. The expert will help the SMEs to carry out an Industrial Research and Experimental Development projects.

Malta Enterprise may provide part financing of the costs directly related to the secondment of highly qualified personnel, seconded from a research organisation or large enterprise. These costs may consist of wages paid by the SME to seconded personnel or fees charged by the research institute or large undertaking for such secondment.

Preparatory Technical Feasibility Studies scheme

Since Research & Development initiatives are associated with high risk it is advisable that enterprises undertake technical feasibility studies to determine that the key elements of the proposed research project are based on sound principals.

The objective of this incentive is to support enterprises intending to undertake Industrial Research and Experimental Development projects in carrying out Technical Feasibility Studies in preparation for these projects.

The Scheme will part-finance eligible related to:

- wages of researchers and technicians, to the extent and for the duration that they are directly engaged in the preparation of the technical feasibility study;
- the acquisition of services required for the preparation of the technical feasibility study;

- the acquisition of knowledge, including technical consultancies and reports required for the preparation of the technical feasibility study.

R& D Clusters

The objective of this scheme is to support formal collaboration between enterprises by assisting in the setting-up, expansion and animation of innovation clusters. The aid will be provided exclusively to the enterprises operating the cluster which must have the sole purpose of promoting Industrial Research and Experimental Development.

Any Undertakings setting-up or operating an innovation cluster made up of a mixture of SMEs and large undertakings, with the aim of carrying out or promoting Industrial Research and Experimental Development activities may be supported under this incentive.

Malta Enterprise may support the cluster by part-financing investment costs related to land, buildings, machinery and equipment and operating costs such as personnel and administrative costs for the management of the cluster's facilities and activities to enhance the networking between the members of the cluster.

Create

This incentive aims to support creative businesses whose economic performance is directly linked to the creative talent of those involved in the business. Further support is provided to help the development of creative communities in artistic zones thus sustaining the development of said zones and interdisciplinary creative cluster developments.

Undertakings including self-employed involved in the creative industry may benefit through this incentive which will be in the form of a tax credit. The aid will be calculated as a percentage of the eligible costs incurred by these undertakings in the development of their creative endeavours.

Malta Enterprise may approve a tax credit equivalent to 60% of the eligible expenditure up to a maximum of €25,000. Costs related to the development and publication of creative work (includes registration of intellectual property rights) are eligible for aid under this incentive. Such costs must be incurred by the applicant between the 1st January 2010 and the 31st December 2012 (both dates included).

Applicants must be registered with the VAT department and in possession of regulatory licences and permits (if applicable), and should not be in default of one's obligations to government in terms of pending dues and/or arrears. Benefits are given as tax credits. The aid is calculated as a percentage of the eligible costs incurred by the undertakings in the development of their creative endeavours.

A creative enterprise is considered to consist of any one of these activities:

i. Visual Arts – The creation of original works of a visual nature, such as ceramics, drawings, paintings, sculptures;
ii. Crafts – the design, creation and production of innovative crafts and restoration;
iii. Film and Video – screen and script writing, provision of filming facilities, casting and production (including pre and post production) and artistic direction services leading to audiovisual production;
iv. Music – music production, recording, performance, song writing and composition;
v. Performing arts – content origination, performance production, dance, drama, theatrical performances;

vi. Literary works – authoring of books and book publishing;
vii. Design – fashion, architectural and spatial design;
viii. Digital Media - interactive entertainment and game development, digital and graphical animation, story-boarding and production.

The incentive provides additional benefits related to creative work undertaken in following creative zones:

- Strait Street, Valletta
- Biċċerija Area, Valletta
- Is-Suq, Valletta
- Savina Square, Rabat, Gozo
- Arch. Saver Cassar Street, Rabat, Gozo
- Saint Mary Street, Rabat, Gozo
- The Collachio Area, Birgu

Foreign Direct Investment
Malta Enterprise as the agency responsible for attracting foreign investment towards Malta has identified key industries such as pharmaceuticals that would benefit Malta by foreign direct investment and has created various incentives to attract these key industries to Malta.

ME roles includes regularly organising delegations to various countries to contact and create affiliations with foreign investors who would consider moving to Malta. Apart from the various financial incentives ME's role is that of helping our new investors to set up their business in Malta and thus advisory services are offered in this regard so as to help them in the initial stages of the company. The full scope or Malta Enterprise work is to be found on the Malta Enterprise web site and associated documentation.

SME Development Grants
The main aim of the incentive is to support Small and Medium–sized Enterprises (SMEs) to develop and diversify their activities, penetrate new markets, increase competitiveness, develop new products and services, and consolidate their existing market share.

Through this incentive Malta Enterprise may provide SMEs with part financing for the first time participation in an international business trade fairs and for subcontracting external experts in relation to new development projects. SMEs in addition are eligible for additional tax credits with potential conversion as a cash refund and at times financial assistance. In addition a possible demininimum grant of €200,000 and financial grants for training staff under ESF are available to SMEs if selected.

Malta Enterprise also offers various forms of aid to support companies and enterprises most notably the investment aid that is offered to companies that are part of specific industries that are being promoted in Malta. Eligible companies have to fall under these specific categories;

a) Manufacturing
b) Information and Communications Technology (ICT)[104]
c) Research, Development and Innovation
d) Eco-innovation, waste treatment and environmental solutions
e) Bio technology

[104] This category excludes Remote Gaming (betting) companies and Providers of Telecommunication Services, in other words any companies that fall within the categories NACE rev 2 class 92.0 and NACE rev 2 classes 60.0 and 61.0 respectively. http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-RA-07-015/EN/KS-RA-07-015-EN.PDF

f) Facilities for Filming and Audiovisual productions
g) Provision of Tertiary Education in Science and Technology
h) Provision of Private Health Care Services
i) Logistics operations by large undertakings

Digital Games enterprises would fall under categories b) ICT and c) Research, Development and Innovation.

This investment aid takes the form of tax credits that are equivalent to a percentage either of the value of capital investment or the value of 24 months of wages of new jobs that have been created by the new investment. This initiative is applicable to investments made from 1st January 2008 till 31st December 2013 when aid activity will be highest but the framework will still be in place beyond 31st December 2013.

Innovative Start-Up Grants

New enterprises need a mix of resources and support in order to flourish. Most start-ups seek external guidance, assistance and finance. This scheme supports new enterprises engaged in existing markets but introducing new perspectives and having the potential to compete in international markets and enterprises engaged in new markets, new technologies, novel products or services and in knowledge based industries that demonstrate a potential for job creation and growth

Enterprise benefiting from this incentive may receive support on:

- Industrial and Development Services
- Investment costs related to tangible and intangible assets

Note: A start-up enterprise is an enterprise in its initial five years.

Exploratory Award

Participation in FP7 and CIP programmes can support SME's in strengthening their competitiveness through:

- networking and relationship building with international partners
- access to centres of excellence
- knowledge transfer
- collaborative research and development and innovative projects

The Exploratory Award Scheme provides assistance in the form of a cash grant to help SME's develop project proposals for submission to the European Commission's Seventh Framework Programme (FP7) and the Competitiveness and Innovation Programme (CIP).

Education and Training

Get Qualified is an initiative that supports the personal development of individuals for the achievement of qualifications and certifications required by industry. The incentive is applicable to individuals following a course of studies leading to a certification, diploma, degree or post-graduate degree courses. Upon successful completion the student will benefit from a tax credit thus recovering part of the costs incurred.

Students following courses approved by Malta Enterprise are granted tax credits of up to 80% on the following costs:

- fees paid by the individual to the university, institution or other entity recognized by Malta Enterprise for the training and educational services leading to the approved qualification.
- fees for sitting for examinations required to achieve the approved qualification.

Eureka Development Grant

EUREKA is a pan-European initiative launched in 1985. The EUREKA network assists undertakings in matching their resources and to collaborate with research institutes for the development of advanced technologies and market oriented products.

This incentive is available to enterprises that carry out a research project in collaboration with other enterprises from EUREKA member states. This project should lead to the development of innovative products, processes and services based on advanced technologies that have a world-wide market potential.

This incentive is open to:

- Innovative projects having ready-to-market results, representing a significant advance in their particular sector.
- Cluster projects covering long-term, strategically significant industrial initiatives. These usually have a large number of participants and aim to develop generic technologies of key importance for European competitiveness, primarily in Information and Communication Technologies (ICT), in Energy and Biotechnology

Any Undertakings setting-up or operating an innovation cluster made up of a mixture of SMEs and large undertakings, with the aim of carrying out or promoting Industrial Research and Experimental Development activities may be supported under this incentive.

Malta Enterprise may support the cluster by part-financing investment costs related to land, buildings, machinery and equipment and operating costs such as personnel and administrative costs for the management of the cluster's facilities and activities to enhance the networking between the members of the cluster.

ERDF International Competitiveness Grant Scheme

The ERDF International Competitiveness Grant Scheme supports enterprises to tap into new international markets. This international competitiveness incentive will support enterprises to extend their activities in new markets or to introduce a new service or product in an existing market. This will assist enterprises reduce their dependence on the local market and facilitate the exploration of inter-regional cooperation opportunities by reducing the risk involved in expanding into new markets.

The ERDF International Competitiveness Grant Scheme will part-finance up to 50% of costs incurred for:

- Translation services from and to the language(s) of the target market(s);
- Marketing material;
- Costs leading to the certification of products, processes and services;
- Participation in international promotional events;
- The wage costs of a newly engaged Business Development Manager.

Projects should be completed within 24 months and must have a minimum value of € 50,000 in eligible costs.

Jeremie
The JEREMIE (Joint European Resources for Micro to Medium Enterprises) initiative is a framework providing a series of coherent actions to promote increased access to finance for micro, small and medium-sized enterprises. The European Investment Fund has signed a guarantee agreement with Bank of Valletta, allowing the bank to provide over EUR 50 million of new loans to Maltese Small and Medium-sized Enterprises (SMEs).

BOV's JEREMIE Financing Package offers advantageous interest rates and enhanced collateral requirements earmarked for SMEs as part of the EU's 2020 Strategy. Target sectors include:

- Tourism and related services including accommodation and food service activities;
- Creative sector including arts, entertainment and recreation;
- Information, Communication and Technology;
- Manufacturing of traditional and new products and services such as aviation;
- Professional, scientific and technical services; and
- Wholesale, retail and the associated storage services.

Through the BOV JEREMIE Financing Package, SMEs and micro-enterprises will be able to:

- Improve the performance of their operations through capital investment in plant and equipment;
- Launch new products and services in new niche markets through capital investment;
- Tap into new export markets by improving the Malta-based operations;
- Enhance the presence on the World Wide Web;
- Invest in Green Technology; and
- Promote and transform Gozo as an ecological island.

Games Development Grants
The Maltese Government declared digital game development a priority area for Malta in the 2010 budget. Following up on this declaration, during the 2011 budget, the government has announced a set of incentives that will be beneficial for game companies. These include a number of annual game development grants for specific projects totalling 150K Euros per annum. A one-time tax rebate of up to 15,000 Euros is also being offered to commercial companies wanting to contract a games company to develop a promotional game for their business. These measures are intended mainly for start-up companies. The details of the grants will be made available during 2012.

4.5.4.3 A note on State Aid

Commission Regulation (EC) No 1998/2006 of 15 December 2006 on the application of Articles 87 and 88 of the Treaty to *de minimis* aid, Official Journal L379 of 28.12.2006 is applicable. In terms of said State Aid regulation, an enterprise may receive a total amount of aid up to €200,000 over a rolling three fiscal year period. This maximum threshold covers all *de minimis* aid granted to the applicant including that received from any entity. Any beneficiary will have to refund with interest any *de minimis* aid in excess of the above threshold. Firms in difficulty, as defined in terms of Community Guidelines on State aid for rescuing and restructuring firms in difficulty are excluded from benefiting from assistance under the Malta Enterprise schemes. In terms of the *de minimis* regulation,

assistance shall not be cumulated with State Aid in respect of the same eligible costs if such accumulation would result in an aid intensity exceeding that fixed in the specific circumstances of each case by a block exemption regulation or decision adopted by the European Commission.

4.6 Legal and Regulatory Frameworks

Fenech & Fenech Advocates have prepared the following highlights of the main regulatory frameworks which any video game producing company must keep in mind.

This part shall touch upon the rules on company formation, which are generally simple and easy to deal with – Maltese companies being effective vehicles which are relatively simple to set up. It is understood that the game companies would want to transport their talent to Malta, and would therefore need to have a working knowledge of the laws regulating the need for visas, residence permits, and work permits. There shall also be a discussion of the general principles of employment laws. The more specific laws are dealt with next, first by focusing on intellectual property rights and the range of electronic commerce, data protection and computer crime laws.

4.6.1 Formation of Companies in Malta

Maltese limited liability companies are allowed to carry out various activities, be it trading, holding or investments. The company can also mix the nature of its business. Company formation expenses in Malta are relatively low, thus making Malta a cost effective jurisdiction, not only for large corporation's tax planning, but also for small and medium sized businesses.

Company names are reserved within 24 hours of application for a period of three months.

A Maltese company is required to have a registered office in Malta.

A Maltese Company must be set up with a minimum share capital of € 1,165 or equivalent of which at least 20% must be paid up on subscription. The authorized share capital is the maximum amount of share capital that can be issued, whilst the Issued share capital is the amount of shares to be issued on incorporation. The minimum share capital must be remitted to a local bank account before incorporation. A separate bank account for the Company can be set up at a later stage.

In accordance with Maltese Law, a Maltese Company must have a minimum of 2 shareholders. Although single member companies may be incorporated there are a number of restrictions that apply, such as for example, the fact that such companies may not have a corporate shareholder and/or director, amongst other limitations. Furthermore, in terms of Maltese law, shareholders have the option to utilise different classes of shares, and each class may have different rights.

Every company registered in Malta requires a company secretary and at least one director who may be either a corporate entity or an individual, Maltese resident or not. The company secretary must be an individual and preferably well versed in Maltese Company Law.

In accordance with Maltese law, the company secretary is an officer of the company. His/her duties relate to the administration of the company, particularly to ensure that the company remains in good standing at all times. These duties include amongst others, making sure that all statutory forms, copies of resolutions, accounts and returns are prepared and delivered to the Registry of Companies on time. Indeed under Maltese law, the company secretary has considerable responsibilities and hence it is always advisable to appoint an individual who is familiar with Maltese law.

A private company must have at least one director. This director may be resident, non-resident, individual or corporate and has the duty to act in the best interest of the company. The law imposes on the directors the responsibility to promote the well-being of the company and to ensure its proper administration, management and supervision of its affairs. Of equal importance is the composition of the board, that is, one would have to decide the minimum and/or maximum number of directors and who of the appointed directors shall be vested with the legal and judicial representation of the Company.

It is important for clients to take note of the fact that a Maltese company must file annual audited accounts with the Maltese Registrar of Companies. However, the books of the Company may nonetheless be kept overseas should this be preferred. Nonetheless, it is imperative to note that the Companies accounts must be audited by a local auditor annually.

In addition, a Maltese company needs to have a registered office in Malta and a minimum of two shareholders, however exemptions to this rule apply. Malta also has a fully-fledged trustee regime and shares may be held by licensed trustees in a fiduciary capacity for and on behalf the ultimate beneficial owners. A Maltese company must have a minimal issued share capital of € 1,165 on incorporation, of which at least 20% must be paid upon subscription.

Maltese legislation also allows foreign companies to change their domicile to Malta. This means that foreign companies can, without the need to wind-up their setup in the foreign country and incorporate a new company in Malta, opt to continue their existing setup in Malta.

It is needless to say that Maltese companies, like in most other jurisdictions, need to adhere to statutory obligations. Amongst others, there is a requirement to prepare annual financial statements, which must be audited by a local independent auditor, and the filing of an annual return, as well as various tax filing matters – tasks that are often looked after to by corporate service providers.

Appendix 4.6 contains an overview of the requirements and process for obtaining Visas and work permits and a summary of Maltese employment law.

4.6.2 Intellectual and Industrial Property Rights

Maltese law on industrial and intellectual property has been largely influenced and shaped by the international conventions and EU harmonisation efforts in this field.

Copyright protection was first the subject of statute when the British Statute of Anne was enacted and, due to Malta being a colony, its also being enacted to the statute books in Malta. Ever since, Maltese Copyright law has been on an evolutionary path, from a purely common law position as can be seen in the definitions for the different works and the threshold of originality, moving towards the continental philosophy, especially in recent years due to EU membership (happening in 2004).

One of the most important features of the Maltese Copyright Act (the latest enactment being Chap 415 of the Laws of Malta) is that the author of the work is deemed to be the owner of the work, unless:

- It is a computer program created by an employee in the course of employment or following instructions by the employer, in which case, the owner is the employer;
- It is a database created by an employee in the course of employment or following instructions by the employer, in which case the employer is the owner;
- There is an agreement to the contrary done between the parties in writing.

The copyright act lists the economic rights pertaining to authors, and includes the list of restricted acts and the limitations, that is, exceptions and defences, allowed at law. Malta allows the defence of private use, as it does the defence of parody. Like all other EU member states, Malta has included the one mandatory restriction for temporary and transient copies:

> *…temporary acts of reproduction, which are transient or incidental and an integral and essential part of a technological process and whose sole purpose is to enable:*
>
> *i. a transmission in a network between third parties by an intermediary, or*
> *ii. another lawful use of a work or other subject-matter to be made, and which have no independent economic significance*

Malta has also incorporated within its Copyright Act the protection of technological measures (technological protection mechanisms and digital rights management systems) and electronic rights-management information, and has outlawed acts of circumvention of these protective measures.

With regard to reverse engineering, the Copyright Act states that copyright in a computer programme shall not include the right to authorise or prohibit the observation and reproduction of the copyrighted work in specific cases. For observation this includes the study or testing of the functioning of the program by the licensed user in order to determine the ideas and principles which underlie any element of the program if this is done whilst performing any of the acts of loading, displaying, running, transmitting or storing the program which he is entitled to do.

And for reproduction, what is unauthorised is the work being:

iii. used for purposes other than to achieve the interoperability of the independently created computer program;
iv. given to other persons, except when necessary for the interoperability of the independently created computer program;
v. used for the development, production or marketing of a computer program substantially similar in its expression to the original program or for any other act which infringes copyright.

The Copyright Act also protects the moral rights of authors, and that covers the right of paternity – that is, to be identified as the author – and the right to prohibit the mutilation, modification, distortion of the work or to the subjecting to derogatory treatment of any work.

Moving away from author's rights, the Copyright Act also protects neighbouring rights: the rights of the producer, the performer and of the broadcaster. The neighbouring rights usually protect against the reproduction of the work, the distribution of the work, the rental and lending of the work, and the making available of the work. The duration of these rights is of 50 years from the date of the fact.

The Maltese industrial property landscape is then made up of trademarks, design rights and patents.

Trademarks are signs which are represented graphically, and are capable of distinguishing goods or services of one undertaking from those of other undertakings. They can consist of words (including personal names), figurative element, letters, numerals or the shape of goods or their packaging. Trade marks confer exclusive rights on the owners for ten years (which can be renewed *ad infinitum*) and which give protection against identical marks or confusingly similar marks/goods. Special protection is also given to famous marks which are not registered in Malta. Trade mark registration

fees in Malta are not expensive. The fee for an application to register a trade mark with the Maltese Industrial Property Registrations Directorate (the Directorate) is EUR116.47 per class.

Patents protect inventions (products as well as processes) so long as they are new, involve inventive step and are capable of industrial application. Having established this, however, there are a number of items which are excluded from patentability. These are:

(a) discoveries, scientific theories and mathematical methods;
(b) aesthetic creations;
(c) schemes, rules and methods for performing mental acts, playing games or doing business and programs for computers;
(d) presentations of information.

The right to a patent belongs to the inventor. However, when an invention is made in execution of a commission or a contract of employment, the right to a patent for that invention shall belong, in the absence of contractual provisions to the contrary, to the person having commissioned the work or to the employer. The law does go on to provide that in such a case, the employee shall have a right to equitable remuneration taking into account his salary, the economic value of the invention and any benefit derived from the invention by the employer.

In 2007 Malta joined the European Patent Convention and the Patent Cooperation Treaty. Malta is also part of the joint effort of a majority of Member States within the European Union to develop a unified patent system and patent court via the enhanced co-operation procedure.

Patents in Malta are valid for 20 years. A maintenance fee has to be paid every year in order to keep the patent 'alive'. Patent application fees costs EUR116.47 – for application and grant – and the maintenance fees range start from EUR58.23 increasing every year to the final payment of EUR232.94 for the 20th year.

The Maltese Government has developed specific incentives for patents. Some have already been discussed above when dealing with the various Fiscal Incentives. Malta has also been successful in negotiating, during its entry into the European Union, for the so called Roche-Bolar exemption for the pharmaceutical industry and the development of generics. With this exception to normal patent rules (which prohibit the production, marketing, distribution etc of items which are protected by a patent in that territory), generic pharmaceutical manufacturers may develop the drugs, run all laboratory testing, apply for marketing authorisations and get all paperwork in line during the last few years of a patent's life. Once the patent expires, the generic company will be able to enter the market from the very next day, thus gaining an immense advantage over other countries which would not allow the drug's development and testing during the validity of the patent.

The **Design right** protects designs which are defined as being the appearance of the whole or a part of a product resulting from the features of the lines, contours, colours, shape, texture and, or materials of the product itself and, or its ornamentation. Designs must be novel (although the element of novelty applied here is not as harsh as that for patents) and must have individual character – thus making the design stand out. The design right mainly protects the aesthetic appearance of objects, however it is also used to protect logos and get-up.

Design rights last 5 years, however they can be renewed for further 5 year periods up to a maximum of 25 years. In Malta, an application to register a design right costs EUR46.59.

4.6.3 Electronic Communications and E-Commerce Laws

Electronic Communications in Malta are fully liberalised and reflect the high level of dependence that Malta has on ICT. Mobile penetration has reached 117% and there are presently four distinct internet submarine cables connecting Malta to the European mainland.

Electronic Communications in Malta are regulated by the Malta Communications Authority (MCA) which has always played a very pro-active role in ensuring that the legislative frameworks relating to electronic communications and electronic commerce can act as a lever to attract high level ICT investments to Malta.

Malta was one of the first Member States to fully implement Directive 2009/140/EC amending the Framework Directive (2202/21/EC), the Access Directive (2002/19/EC) and the Authorisation Directive (2002/20/EC). Furthermore, Directive 2009/136/EC (amending the Universal Services Directive (2002/22/EC), the Privacy and Electronic Communications Directive (2002/58/EC) and the Regulation on consumer protection co-operation between national regulatory authorities (2006/2004/EC)) has also been transposed into Maltese law.

These changes mainly related to issues of net neutrality, the introduction of the right to internet access, further rules relating to data privacy as well as spectrum and broadband reforms.

The Maltese legislator has not only transposed European rules relating to electronic communications but also ensured that our unique geographical position does not hinder Malta from becoming an ICT centre of excellence. In this spirit, the Maltese regulator has in 2009 published laws whereby every operator of an international internet gateway has to ensure continuity in international connectivity at all times.

These regulations oblige an international gateway operator, to adopt appropriate measures to safeguard the integrity and resiliency of the network at all times; to secure the availability of capacity, or have in place alternative measures, sufficient to ensure an adequate level of uninterrupted international connectivity; not unreasonably refuse the provision of capacity to another international gateway operator for these purposes; to periodically submit contingency plans to the MCA, and to submit information regarding the plans and measures that it has put in place. Service providers must also inform their clients of the level of redundancy.

The regulations give the Authority the power to periodically issue guidelines, audit the contingency plans submitted by the operators and ask for other information as deemed necessary. It has the discretion to determine if an operator acted 'unreasonably' in refusing capacity, according to the specific circumstances of the case.

The Maltese Electronic Commerce Act transposes both the EU Electronic Signatures Directive and the European Electronic Directive thereby fully recognizing electronic contracts, validity of electronic documents as well as electronic signatures and which served as the basis for Malta's development as a centre of excellence in ICT most notably in e-government services in which Malta is a European leader.

4.6.4 Data Protection

Data Protection legislation is a relatively new concept in Malta with the introduction of the first ad hoc legislation on the protection of personal data in 2001. Maltese laws fully transpose EU Directive 46/95/EC through the Data Protection Act (Chapter 440 of the Laws of Malta).

The level of protection of personal data found in Malta is identical to the level of protection found under Directive 46/95/EC. Slowly, the culture of personal data protection is becoming ingrained in the operations of Maltese Data Controllers who are all obliged to notify of their operations with the Maltese Data Protection Commissioner.

The Maltese legislative regime on data protection also transposes EU Safe Harbour Rules relating to the processing and transmission of personal data to countries falling outside the EU and the EEA.
Due to the high level of protection that the law provides in Malta, the island has also experienced an influx in data services such as international call centres as well as the re-domiciliation of various operations running on the processing of personal data. These also include personal data databases relating to remote gaming companies.

Processing of personal data in Malta can only be carried out if the data subject has given his unambiguous consent for such processing or in the cases as explicitly stated in the law which include situations where:

- processing is necessary for the performance of a contract to which the data subject is party or in order to take steps at the request of the data subject prior to entering into a contract; or
- processing is necessary for compliance with a legal obligation to which the controller is subject; or
- processing is necessary in order to protect the vital interests of the data subject; or
- processing is necessary for the performance of an activity that is carried out in the public interest or in the exercise of official authority vested in the controller or in a third party to whom the data is
- disclosed; or
- processing is necessary for a purpose that concerns a legitimate interest of the controller or of such a third party to whom personal data is provided, except where such interest is overridden by the interest to protect the fundamental rights and freedoms of the data subject and in particular the right to privacy.

The term 'processing' is defined very widely under the Data Protection Act as any operation or set of operations which is taken in regard to personal data, whether or not it occurs by automatic means, and includes the collection, recording, organisation, storage, adaptation, alteration, retrieval, gathering, use, disclosure by transmission, dissemination or otherwise making information available, alignment or combination, blocking, erasure or destruction of such data.

The Data Protection Act also lists the principles of data processing as listed in the EU Directive.

A number of subsidiary legislation has been published in Malta relating to the processing of personal data by the police, the processing of personal data within the electronic communications sector as well as the processing of personal data relating to minors.

4.6.5 Computer crime

The establishment of Malta as an ICT centre of excellence are required the proper protection of ICT assets including software and hardware elements situated in Malta against criminal activity.

Computer Crime is regulated in Malta under a specific title (Computer Misuse) within the Criminal Code. The provisions related to computer integrity crimes and reflect the provisions contained in the Budapest Convention on Cyber Crime.

Under Section 337C of the Criminal Code, it is unlawful for an unauthorised person to do the following acts:

a. uses a computer or any other device or equipment to access any data, software or supporting documentation held in that computer or on any other computer, or uses, copies or modifies any such data, software or supporting documentation;
b. outputs any data, software or supporting documentation from the computer in which it is held, whether by having it displayed or in any other manner whatsoever;
c. copies any data, software or supporting documentation to any storage medium other than that in which it is held or to a different location in the storage medium in which it is held;
d. prevents or hinders access to any data, software or supporting documentation;
e. impairs the operation of any system, software or the integrity or reliability of any data;
f. takes possession of or makes use of any data, software or supporting documentation;
g. installs, moves, alters, erases, destroys, varies or adds to any data, software or supporting documentation;
h. discloses a password or any other means of access, access code or other access information to any unauthorised person;
i. uses another person's access code, password, username, electronic mail address or other means of access or identification information in a computer;
j. discloses any data, software or supporting documentation unless this is required in the course of his duties or by any other law.

These provisions, together with other provisions criminalizing software piracy and online child pornography, establish a very high level of protection vis-à-vis computers and other internet related elements under our law.

It is also important to note that under our provisions relating to cybercrime, if any act is committed outside Malta which, had it been committed in Malta, would have constituted an offence against the provisions relating to cybercrime, it shall, if the commission affects any computer, software, data or supporting documentation which is situated in Malta or is in any way linked or connected to a computer in Malta, be deemed to have been committed in Malta.

The Malta Police Force has a dedicated Cybercrime Unit which is responsible for the investigation and persecution of cybercrimes in Malta and also serves as a point of contact for other foreign enforcement agencies who are investigating any cybercrime which might have also a Maltese connection.

4.7 Quality of Life in Malta

Country	Avg rent in urban area (per month basis) - 1 bedroom apt/2 bedroom apt	Average inflation rate predicted for 2011	Crime rate per 1000	Income tax rate - average rate for single person @ €30,000 pa	GDP per capita

Malta	€400/€550	2.60%	negligible	19.42%	€16,640
UK	€1480/€2045	4.20%	85.55	14.27%	€39,685
France	€800/€1100	4.93	62.18	11.79%	€22,156

Table 4.7a: Quality of Life Comparison

In recent years Malta has been promoted as a hub for financial services and as a centre of excellence in ICT. The 'whole package' that Malta has to offer to any foreign investor and not just the economic and industrial infrastructure made this possible.

Within the 'whole package' we are referring to all the reasons why moving to Malta is valuable and profitable not only for companies but also for prospective employees and professionals. A country may offer the best tax incentives and financial benefits to attract companies to its shores but these would be ineffective if it cannot offer the right conditions for a company to be able to exist and grow. This is also applicable to those people who have to run and work for these companies.

Over the years Malta has managed to attract to its shores an ever increasing number of expatriates. These range from pensioners who want to enjoy their remaining days in peace and quiet, to professionals who feel that Malta has a lot to offer in terms of career and lifestyle. Malta has managed to create an environment that caters for the manager who wants to have a blooming career whilst at the same time bringing up a family to the young professional who wants a rewarding career but has easy access to leisure time and places of entertainment.

Malta joins the EU and adopts the Euro

Malta became a member of the European Union in May 2004 and this meant that all immigration laws were changed to cater to its new status as an EU member state. All EU member states have to ratify the principle of Free Movement of Workers which means that all EU citizens have the right to work in any EU member state. (Currently there are some restrictions to nationals of Bulgaria and Romania due to a transitional agreement of seven years from their EU membership in 2007.) The Free Movement of Workers entitles all EU citizens to look for a job in any EU country; to work in any EU country without needing a work permit; they may reside in that country for work purposes; they have the right to remain in that country even after their employment has finished and all EU nationals must be given equal treatment as the local nationals in access to employment, working conditions and any other social and tax advantages. These rights are also extended to the families of those EU nationals who aren't working in their countries of origin but are employed in another EU member state.

From 2004 onwards any EU national could move to Malta and find a job as easily as if they were doing it in their country without needing to go through excessive bureaucracy or risking any form of discrimination. EU nationals were thus also allowed to buy property in Malta and even move here permanently, enjoying the same rights and benefits as Maltese nationals. This generated a renewed interest in Malta as a place of residence and also meant that new opportunities arose for non-Maltese EU nationals who wanted to start a business in Malta.

The next step towards the consolidation of Malta's attraction to EU nationals was adoption of the Euro in 2008. Anyone who came to live in Malta from one of the Eurozone countries would now be getting 100% value of their money and earnings. Using the same currency meant that there were no more charges and commission fees for changing from one currency to another and it also meant the value would always remain the same and not be subject to the fluctuations of the market and currency

exchange. This meant that Eurozone nationals had the same purchasing power (in relation to value and not local prices) both in their country of origin and in any other Eurozone country they decided to move to.

Adoption of the Euro reduced exchange rate driven trade barriers for EU companies (excluding the UK) based in Malta since the currency was the same as that of their country of origin and of their market base. Any institution could therefore avail itself of better incentives and financial benefits that were being offered here.

Taxation

As mentioned in other sections of this report Malta offers various financial benefits; namely advantageous taxation rates and incentives that take the form of tax credit so as to attract further investment. Amongst these are the double taxation agreements and the resident scheme regulations.
Another scheme being offered by the Maltese authorities is a special income tax scheme known as the 'highly qualified persons' scheme' targeted at foreign CEOs or other high end positions. Anyone who earns €75,000 or more per year, has a qualifying position and relocates to Malta benefits from income tax at the base rate of 15%. This scheme also puts a cap on taxable income at €5,000,000 over the course of their employment in Malta. The idea behind this scheme is to attract professionals who can bring to Malta their expertise and knowledge base and possibly start new companies in Malta.

Even without these added tax benefits many ex-patriots find that Malta's tax rates are lower than in their country of origin. In Malta the maximum income tax rate is 35% (from €19,000 onwards) in Sweden the minimum income tax rate is of 30%. Maltese authorities do not enforce certain type of taxes that are found in other countries like Germany or France. For example one of the main reasons why some professional poker players are moving to Malta is because they do not have to pay any taxes on their winnings. This is also encouraging many remote gaming companies to organise some of their large poker tournaments in Malta and making them very popular with foreign players. For example in France 3% of the winning pot is taken automatically by the French authorities as a form of iGaming tax, in Malta there isn't this type of tax.

Quality of Life in Malta

In the January 2011 issue of the prestigious magazine International Living, Malta ranked second (together with New Zealand) in its Quality of Life Index for 2011 out of a total of 192 countries. This index took into account as many factors as possible including, Cost of living, Leisure and Culture, Economy, Environment, Freedom, Health, Infrastructure, Risk and Safety and Climate. These results were produced by referring to official statistics coming from various sources like UN agencies combined with opinion polls and interviews with ex-patriots who moved to the country.

When considering quality of life many aspects have to be taken into consideration and a bigger picture drawn together. Apart from the physical and geographical aspects of the country one has to also look into the political and infrastructural aspect. When moving to a new country, every person will look into improving their quality of life or at least try to find something as close as possible to the lifestyle or standard of living they enjoyed in their country of origin.

Climate and Lifestyle

Malta offers a mild climate throughout the year with the exception of the summer months when Malta's climate is hot. Malta arguably offers the best that can be asked for from the Mediterranean climate. The climate is one of the main factors that attract professionals from Scandinavian countries. Many of the young Swedes who work in remote gaming companies have chosen to relocate to Malta

instead of other countries like the UK because of the climate.

Malta can offer a high quality lifestyle with all its required amenities and the best living conditions. The crime rate is one of the lowest in the world and anyone can walk safely in the streets at any hour of the day and night. Health care in Malta is of the highest standards with public having access to the recently opened state hospital Mater Dei and access to a number of private hospitals. The medical course in Malta is one of the best in Europe and a large number of medical professionals have also studied and worked in other countries like the UK. Public health amenities are free of charge in the most part and the services offered by the private sector have more accessible prices compared to those of other European countries.

Renting in Malta is easy, with more and more property available on the market, and rates are varied and most of the time very reasonable. One can easily find long lets in the main areas like Sliema and St Julians at rates of €500 per month for a two bedroom apartment. The advantage of Malta is that in general, commuting distances are short and travelling is rather easy. Therefore one can opt for property (to rent or to buy) that is outside the central and busy zones of Sliema/St Julian's/Gzira. By making this choice one can find property at very reasonable prices and avoid the problems associated with busy towns like traffic congestion and parking availability. One can also opt to reside in one of Malta's typical villages and enjoy the tranquillity of the Maltese countryside but still be within a thirty to forty-five minutes' drive from most city/business centres like Valletta and Sliema.

Although Malta does not have large cities like London or Paris where one can find all types of amenities and services, one can easily opt to reside in the busy Sliema/St Julian's area. This area is the main tourist and entertainment zone on the island but it also offers many other advantages. Most international offices and institutions have chosen this area for their offices or have branches in the area. Portomaso Tower in St Julian's has managed to attract many offices of remote gaming companies and the Gzira/Sliema waterfront hosts the offices of a large number of financial services companies. The Sliema/St Julian's area also contains one of the biggest shopping centres on the island, 3 shopping malls, a large number of supermarkets spread throughout and a limitless number of restaurants and cafes. All the area is surrounded by the sea and the beaches (mainly rocky) are frequented both by Maltese and foreigners. Paceville is also part of St Julian's and here one can find most of the five start hotels on the island and the majority of nightclubs only a few streets away. Paceville is the main entertainment area of Malta and Gozo and it hosts a large number of bars, nightclubs, restaurants and even two casinos.

Many foreigners decide to move to this area when they relocate to Malta, not only because it is the busiest part of the island but also because it easily accessible by public transport and it is the closest you get to a cosmopolitan area. Renting property in the area is easy and there are all types of property on the market from the luxury apartment in a complex like Tigne or Portomaso or normal well-kept apartment in one of the Sliema side streets. The property prices are relatively higher (compared to other parts of Malta) and daily commodities like supermarkets are higher. Other problems are traffic congestion, parking availability and overcrowding during the tourist season.

Owning a car in Malta can be relatively expensive; this is because the prices of cars are still high (due to taxation), fuel prices are rather high and there are expenses related to a vehicle like insurance and maintenance. Maltese public transport is relatively cheap (A day ticket costs €2.60 for non-residents and €1.50 for residents) and accesses most parts of Malta and Gozo. The other form of public transport is by taxi and the average taxi ride costs between €15-€20 per trip which means that a shared taxi is very cheap. White cabs tend to be more expensive than garage owned cabs but are the normally seen driving around ready to offer their services without needing to book beforehand.

4.8 Technology Infrastructure

The game industry has always been a rapid adopter and demanding user of leading edge technologies. In the past, gaming has been a significant driver in the adoption of sound, colour and 3D graphics on computers. Today, gaming is the strongest application sector in both Facebook and iPhone applications – and these sectors of social and mobile gaming represent the fastest growing part of the games industry. Perhaps the most obvious current trend in gaming therefore, is the move to online connectivity for the gaming business, both in terms of development methods, and games features.

Games industry companies such as developers and publishers can readily equip themselves with state-of-the-art hardware and software. Therefore the technical infrastructure they need from their location is primarily a) connectivity to the internet and b) server hosting at scale. These services are necessarily provided by large infrastructure companies, since the investment required is larger than feasible for small to medium sized companies.

Internet Service Providers

Internet Service Providers (aka ISP's) provide a broadband link between a local business building or site and the internet. As such, these are essential link for all modern business types, and the games industry, as a modern, digital, content centric operation is strongly dependent on ISP services for day-to-day operations. It is tempting to treat ISP's as a standard utility, like electricity or water, but modern games and media industries are particularly dependent on their link to the internet, so we will cover this support industry in more detail below.

A typical business will use the internet for email; web browsing; e-commerce both buying and selling, communications including voice/video over IP aka VOIP; file transfers of documents; storage and backup of all sorts of data; and connecting multiple-sites. A games company will typically use all of the above, with extra requirements, since the particular types of data used by games includes intensive audio, video, graphics (2D & 3D) and real-time interaction protocols – all of which can be very demanding for broadband capacity and latency (more on that later). Depending on the particular class of game genre and game company type, the office ISP link maybe used for a) just 'development purposes' i.e. more like an isolated R&D operation, where most internet service is about a business-to-business linkage, or b) also 'publishing services', i.e. connecting over the internet to thousands or millions of customers, in a business-to-consumer model. The latter publishing model demands much higher service levels from an ISP.

Go	ISP	http://www.go.com.mt/
Melita	ISP	http://www.melita.com/
Bell Net	ISP	http://portal.bell.net.mt/usercheck/
Vodafone	Mobile ISP	https://www.vodafone.com.mt/

Table 4.1 Major ISP companies in Malta

There has been much consolidation in the ISP market in the last decade, as experienced elsewhere in Europe, leaving Malta with 3 major land-line ISP's and 1 major mobile ISP (Vodafone). Competition and services in these sectors are driven across both consumer and business markets, which together drive investment. The internet backbone from Malta is routed via undersea cable to Sicily, through

Italy and onto the European mainline. Multiple choices of provider gives price and service competition, but ultimately, with Malta being an island, the link is highly dependent on sub-sea cables to reach the European mainland. Disruption or congestion to services on these cables can be caused by human error, technical malfunction, electricity outage, or natural disasters. Though downtime is rare, it has occurred occasionally in the last few years, and hence internet centric companies with business critical systems are likely to have secondary systems hosted on the continent too.

When buying internet connections, the three primary factors are cost; bandwidth; and quality of service. Cost is charged according to the bandwidth, and is subject to massive variation on a global scale. For example, an OECD survey showed a 30:1 variation in consumer costs between Japan/Korea (cheapest) and Portugal/Poland (most expensive). However, internet bandwidth cost is decreasing exponentially over time, for technical reasons related to Moore's Law in computing: i.e. upgrading new router equipment (which gets better at a similar speed to computing improvements) at either end of an optic fibre link will give higher bandwidth without having to replace the physical cabling. Quality of service is usually expressed in a service level agreement (SLA) which forms the contract between the ISP and the client company. SLA requirements for gaming include the usual factors, including reliability and security, that ISP's offer, but games servers require one very special factor to be addressed in the SLA: latency.

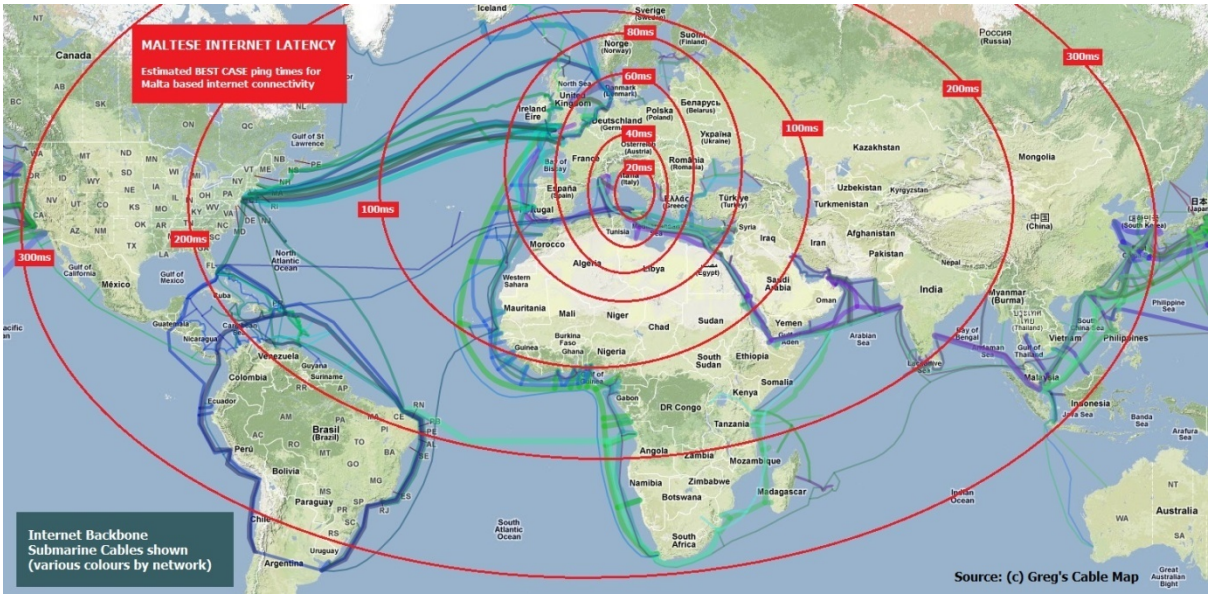


Figure 4.4 Maltese Internet Latency

Latency is the time it takes for internet messages to reach their destination, typically measured as 'ping time'. In a long distance telephone call, latency is experienced as a delay in voice response. In internet gaming, latency is experienced as the game 'lagging', which can degrade and disrupt the game experience, causing players to lose interest. This is important when hosting games servers, because games are interactive. Depending on the genre of game being played, ping times ranging from 30ms (e.g. action games) to 150ms (e.g. strategy/MMO game types) would be acceptable. Some games are technically turn based, and would run well even with a ping of 300ms (e.g. most Facebook games).

The major factors in latency are distance; network structure and hosting overheads. Distance determines latency since signals cannot travel faster than the speed of light, whereas hops between network routers can slow down a message every time it needs to navigate a signal junction. Test

measurements show Malta is 40-60ms latency away from central Europe and the Middle East, up to 85ms Northern Europe/UK. The USA east coast is approximately 200ms away, and 300ms for the west coast USA, Japan and the Far East. The signal is always routed from Malta to Sicily to Italy, so ISP's depend heavily on those locations.

Current mobile standards are based on 3G networks. Across Europe, in the next few years, mobile operators are likely to invest in 4G wireless systems, based on LTE or WiMAX standards. These will have bandwidth equivalent to today's fixed landline connections, and this may shake up the ISP market again, as individual devices become highly mobile – perhaps represented by the 'iPad era' of computing. Such a change will have many unforeseen effects, especially in the consumer space and with mobile devices, but it will not immediately replace the need for high bandwidth landline connections into large datacentres.

Data Centre Hosting

Data centres are large scale computing centres linked to high capacity bandwidth onto the internet. The service of renting computing power in these facilities is known as 'hosting'. These rooms are typically full of powerful computers called servers, all networked together with large storage capacity in a clean, air conditioned and cooled environment, with large amounts of reliable electric power requirements. The internet connection is key to these, and bandwidth (speed) and latency (lag) are important factors.

Recent high profile hacking incidents (e.g. Sony PlayStation network in April 2011) have shown that games companies are highly visible targets for hackers. Hence security is vital in hosting scenarios, both physical security against accidental and malicious damage, and information security to preserve data from loss and protect it from unauthorised access.

Hosting is a global business though, and physical access is not usually required by the client. For many clients, and applications, it is not directly important where their servers are hosted, and this means that competition for server hosting has many factors: including proximity to customers; bandwidth; latency; costs; reliability; security. This competition is intense, and takes place within a highly dynamic and international market. Within the cost factor, large network applications incur high costs in electricity and storage – e.g. Facebook the company has estimated that for every $1 it spends on bandwidth, it spends $2 on electricity and $4 on storage. This formula will vary according to the particular characteristics of an application or game, but it's clear that electricity cost are important – both for operating the computers and for air conditioning and cooling the computer rooms. Since Malta is an island with a hot climate, the costs of electricity and cooling are inevitably at a disadvantage compared to mainland Europe.

Taking a second large scale example, the massively multiplayer game World of Warcraft is hosted on servers in 4 different time zones across the USA alone, ensuring a good balance of costs and proximity to customers (which is a key determinant of bandwidth and latency). In Europe, hosting is often segmented by player language spoken, ensuring that players have matchmaking to play games with others they can understand in chat modes.

Legal server location can be important for data centres, since they frequently host financial transactions, and the legislation governing this have historically led to Malta being a significant player in remote gaming markets. This means there is already a strong server hosting industry in Malta, and many of the skills (e.g. systems administration, Linux, networking, virtualisation) and computing facilities would be usable by the games industry. Current trends in games are moving towards Freemium business models, typically funded by micro-transactions, typically in the €0.50 to €5 range.

Such financial transactions can use a variety of payment mechanisms, e.g. VISA, PayPal, mobile operator chargebacks, many of which use the same backend hosting systems as e-commerce.

The table below shows a selection of some of the hosting companies currently operating in Malta.

Computime	Hosting and communications	http://www.computime.com.mt/
Siemens SIS	Communications & data transmission	http://www.sis.com.mt/sis/
Vodafone	Mobile ISP-based hosting	https://www.vodafone.com.mt/
Go	ISP-based hosting	http://www.go.com.mt/
Melita	ISP-based hosting	http://www.melita.com/
Continent 8	100% online gaming dedicated	http://www.continent8.com
Malta Hosting	Web hosting & design	http://www.maltahosting.net/

table 4.8b Examples of Data Centre / Hosting companies in Malta

A games company setting up in Malta could choose or mix from three main approaches to their server hosting needs: a) Self-hosting – buy internet connectivity from ISP but run all computers themselves; b) Malta-based data centre – buy time on computer servers locally; c) international hosting – buy remotely from companies, e.g. Amazon, Rackspace. Each approach will be architecturally appropriate to different applications and needs, so the need for gaming companies is that all options should continue to be available to them.

Finally, there are some sectors of gaming which are too demanding to consider hosting in any one place, either in central Europe or in Malta. One is the extreme of action gaming, e.g. represented by person-v-person shooting in Call-of-Duty (the most popular Activision title last year) which requires multiple servers located very close to the player, who typically chooses the lowest ping (nearest) server available for the best experience. Another emerging gaming technology is cloud gaming, where the game graphics are streamed, from the server which runs the game, to the consumer's home, in a manner similar to cable television on-demand. This is both compute-intensive and bandwidth-intensive, suggesting that servers should be hosted by the ISP nearest to the consumer, meaning that different servers are likely to be required in every country where consumers play.

4.9: Summary of expected strength, weaknesses, opportunities and threats that Malta faces as it seeks to grow its gaming sector (particularly from inward investment)

Once the evidence base for the local audit is analysed and reviewed it becomes clear that Malta has some significant gaps that need to be addressed for it to become a fertile ground for a thriving game industry to grow and develop there. This is particularly the case when it comes to attracting established, large players in the sector to the island. Having said this, inherent structural and cultural qualities of the country make it more than viable for these challenges to be overcome. The following section outlines these challenges and opportunities, summarizing the findings that came out of the research conducted in relation to this chapter.

Possibly the most considerable challenge Malta faces as things currently stand, there are few individuals with game-specific training, particularly in artistic roles. Although it is to be expected that a territory that does not have an established game industry will have a low number of professionals with experience in the game industry, most territories have some form of garage development or a cottage industry of casual game developers. Malta has a very small one. Out of the few companies that exist in Malta there is small number of individuals located on the island have established experience in the industry. Turning to the gaming community we did not manage to find any sizeable group of gamers that developed mods, re-skins or any other casual development. One outstanding area of game development happening in game specific skills centres around the Games Development Challenge organised by St Martin's Institute and the Gamezing competition established by University of Malta. These have started to get potential game developers interested in forming teams and taking part in development workshops and events, with teams are all students ranging from secondary to junior college and undergraduate degree levels.

To compound the skills-gap problem, when we turn to related industries that could feed talent into an incoming industry we are faced with another major gap: there is a serious lack of professional, practicing digital artists with a very poor supply of 3D modellers, animations artists, character modellers, technical artists and the like. There is also a surprising lack of professional concept artists and lead artists that one would expect to find in pretty much any developed region. The reasons for these shortages has been given in section 4.1, but chief among them is the lack of an ongoing local demand and budget for such dedicated work.

This means that not only is there a major skills gap in game-specific industry roles but also in related artistic fields both digital and non. If Malta does not develop a solid talent pool of skilled labour, it runs the risk of attracting game companies thatset up in Malta, take advantage of the fiscal benefits and then move out without leaving any trained staff to spawn their own venture or supply other, incoming companies. It is thus not in Malta's interest to simply attract game companies to its shores but to attract game companies that will run the development of their games in Malta.

We haven't discussed programming roles as much in this consideration not because Malta is bustling with game-specific programmers, but because game programming is always a contextualisation of a larger field of expertise. In the case of programming roles, this larger field of expertise is more established, both in the existing work-place and in courses delivered at various institutions. Although game-specific talent is obviously required for these roles also, there is, at least, less of a gap in related industries like software development.

Educational institutions are key in addressing the skills-gap that has been identified. The progress made at MCAST Art and Design is a good sign for growth in creative education. This institute could be

a catalyst for the growth needed in artistic skills, particularly digital ones. The complication faced by MCAST is its falling under a larger organisation that aims at standardising the institutes under its umbrella.

When it comes to game related courses, the major skills gap that exists requires immediate action to be able to address the issue with graduates in the near future (a few years' time). The small number of education providers and single University in Malta mean that these institutions need to collaborate closely in order to give a well-rounded education that caters for the variety of game industry jobs needed from entry level to top-end positions. It is doubtful that a single institution can carry out such an education, but as things stand already, the educations being given and planned for the near future are relatively complementary.

4.9.1 Malta's Value Proposition

Can-do business attitude of Maltese regulators
One of the most important advantages Malta has to offer, as one can see from the gambling industry scenario, is the speed and adaptability it can deploy when reacting to existing opportunities for growth. The government has earmarked the video game industry as a priority area for the country and thus its bodies are very willing to listen to suggestions for legislative changes, incentives packages and other changes. The small size of the island and resultant accessibility to policy makers along with a blank slate in terms of established industry makes it easier for incoming industry to shape the sector and receive support from government. Regulators have consistently aimed to deliver a fair, quick and efficient service, approachable and building good relationships with service providers. They have also continuously strived to better the service they offer and cater for new developments to render their services more efficient.

Although an indirect advantage this openness from government and the country's adaptability should not be taken for granted as it is a promising sign of ability to change and adapt. A concrete fruit of this attitude from government is the new legislation on tax refunds on dividends to foreign shareholders.

Fiscal Schemes
The fiscal incentives detailed in 4.5.4 have been a very attractive factor for Bigpoint to set up in Malta and as the producer of the locally produced Battlestar Galactica explained, it turned out to be very profitable for Bigpoint to develop the game in Malta.

Aside from this considerable fiscal attractor there are other, lesser, financial incentives offered by Malta Enterprise that an incoming company can draw on (see Section 4.5.2 for a more detailed overview). A 15% tax capping extension to the digital gaming directors and designers salaries has now been approved, which adds to the existing set of attractive incentives.

Competitive Salaries
Although the country lacks game-specific talent, the staff that can be recruited and developed come at a significantly lower cost than that incurred in European game hubs. A programmer (non-specialist) in Germany earns (on average) €30,000 as a starting wage, going up to €45,000 at the five years' experience mark and topping at about €65,000 for ten years and above experience.

Graphic designers/artists start off around the €25,000 mark, go to €40,000 at the five year experience level and reach €55,000 at senior level (ten years and above experience).

Maltese wages are considerably lower with programmers starting off with an average annual gross wage of € 20,000, going to € 25,000 at the five year mark and levelling out at € 32,000 at ten years and above experience levels.

Graphic designers start at € 15,000, going to € 20,000 at the five year mark and levelling out at € 25,000 at ten years and above experience levels.

With the majority of expenses incurred by a games company going towards wages the lower salary costs in Malta are going to be an obvious advantage to studios setting up in Malta and employing Maltese staff at local salary levels. Similarly, supporting service costs are cheaper due to the lower wages paid out in those companies.

Proven Location for Game Development
Although few game companies exist on the island so far, Bigpoint, Crytologic and Connexo, have proven that it is possible to run a development operation from Malta and reap the benefits of the generous tax rebate. The Bigpoint 2010 release of Battlestar Galactica was followed up with great success, gathering over a million users. It is so far the only major game developed on the island, but its success sets a precedent for incoming companies.

Language and Localisation
English, together with Maltese, is Malta's official language. The common use of English on the island and the high level of proficiency in most educated people, along with an education that is carried out almost entirely in English makes it easier for companies to conduct business and work with academic institutions. It also makes it easier for incoming employees to be integrated into the society since no language barrier exists as is the case with continental Europe.

Aside from the use of English as an official language, Malta has an existing number of translation agencies that translate to and from a large variety of languages (see table 4.4a). This can prove to be an asset for incoming companies needing localisation

Technology-driven and Technology-Neutral Legislation
Maltese laws deal with issues of net neutrality, the introduction of the right to internet access, further rules relating to data privacy as well as spectrum and broadband reforms. In 2009 the Maltese regulator published laws whereby every operator of an international internet gateway has to ensure continuity in international connectivity at all times.

Legislation is also increasingly geared towards the proliferation of e-commerce and the creative industries as is the case with, for example, the CREATE scheme specifically targets the Creative Industries and the R&D Grant.

Easy Company Incorporation
Malta requires minimal red-tape for company incorporation and other corporate affairs. As described in section 4.6, setting up a company or corporate entity in Malta cannot be any easier.

Strong Cyber-Crime Legislation
The Criminal Code provisions, together with other provisions criminalising software piracy and online child pornography, establish a very high level of protection vis-à-vis computers and other internet related elements under our law.

Quality of Life

As discussed in section 4.6, the quality of life in Malta is very attractive. The climate is mild and pleasant most year round, dominated by sunny days and blue skies. Aside from the climate Maltese residents enjoy an attractive life-style which is both relaxing as well as full of opportunities for entertainment, whether one is interested in cultural and artistic events, sports or clubbing. The crime rate in Malta is one of the lowest in the world, health amenities are free and of a good standard. The price of attractive housing is much lower than in virtually all European cities, both in terms of rent and purchase. Incoming employees with children can choose from a host of high-standard schools at all levels.

Although an island, Malta's small size means that the airport is easily accessible within the half-hour from around the island by car. From there on, all major game hubs in Europe are, on average, three hours away. Although other locations might be better connected by land, Malta makes up for this by its small size and low-traffic airport.

Malta's biggest disadvantage is also, in many ways, an advantage. The fact that the island currently lacks an established game industry presents both challenges and opportunities to incoming and indigenous companies. On the one, there are a number of hurdles that need to be surmounted in the initial years. On the other hand, the island is still a blank slate for the first movers to help shape. With the willingness from government's side to adapt to the needs of the industry, the eagerness of institutions to teach game-related courses and the raw labour talent available to train, the country has the potential of attracting industry individuals and companies that will have a considerable role in building up a fresh industry according to their visions. The generous tax incentives to shareholders should also be attractive, both for development studios as well as publishing houses.

Summary of Malta's Value Proposition

- Can-do business attitude of Maltese regulators.
- 6/7s tax refund scheme. Dividends paid out to shareholders are refunded 6/7s of tax paid. No further tax (including income tax) is payable on this income.
- Low salaries when compared to European game-hub locations.
- Proven base for international iGaming companies.
- Good transferable people skills from iGaming centred on player analytics, statistics and data mining.
- English speaking.
- Ready availability of a wide range of languages would be useful for localisation services.
- Technology-driven and technology-neutral legislation.
- Easy company incorporation.
- Strong cyber-crime legislation.
- Excellent climate and standard of living with a low crime rate, good, free health system and education as well as cheap high-end property rental and purchase.
- Easy access to most European game-hubs and capitals: 2-3 hours to Paris, London, Hamburg, Munich, Amsterdam etc.

Chapter 5: Competing Locations, Education and Comparative Findings

Lead Authors: Ian Shaw, Heather Chandler, Frederic Leymarie.

"It's geography that determines which parts of the world are going to develop most rapidly. At the same time as social development increases, the meanings of geography tend to change, and so what had been a huge advantage at one point in history ceases to be one as you move into a new stage when new forces of development have been unleashed..."

Ian Morris, Stanford Professor of History, in interview by Nesta

5.1 Overview of global games industry locations and their role in servicing the gaming sector

Globalisation is a term common to technology, and its effects are very much felt in games too. A modern game title might be developed in the UK, for a USA-west coast publisher, with artwork done in China and India, and localised voice recordings done in Spain, all sitting on a graphics engine from USA-east coast, and built with software tools from Canada. The resulting title would be sold around the world on consoles from Japan and the USA, or on standard PCs depending on territory preferences. So globalisation applies to both the consumer markets, and to the supply chain of games. Games evolution runs at a rocket-fuelled pace, driven by technology and hit consumer trends. Considering such change against the rate of global economic variations, we begin to see why the games industry today is a highly changeable marketplace. As an industry, it has sustained compound growth in the 10-20% range for nearly three decades, so this pace of global change represents a big opportunity for the winners.

The USA is the world's largest games market, and as might be expected, also host to the largest games industry in the world. Different cities play notably different roles. San Francisco, with a clear influence from Silicon Valley, is where the several platform owners and publishers are based and the big technology players based there almost all participate in the hardware or software stack used by games today. Meanwhile, Los Angeles has also been a prominent place for publishers to settle, giving them close access to Hollywood with its rich heritage and portfolio of intellectual properties.

Seattle is, perhaps surprisingly, the largest cluster of games development in the USA, inheriting a rich software engineering history from Microsoft corporation, and hosting Nintendo's US operations too. From a corporate perspective of headquarters and executive decision making, the US dominates the western gaming industry, both platforms and a publishing perspective. Next door Canada participates in the rise of the US, and companies there usually have offices on both sides of the border, with flights and trade operating with few restrictions across the border. Canada has overtaken the UK in the last few years to become the third most important country for the games industry.

Japan takes second place in the global games market. As the home to Nintendo, Sony and Sega, it has long been the dominant player in the console market, and it is only since 2001 that Microsoft has provided a modern USA-based console competitor. Console heritage has often led to Japanese companies having a reputation for excellence in very particular genres, and the games names are often more famous than the companies – e.g. Polyphony Digital for Gran Tourismo, and Square/Enix for the Final Fantasy series. In recent times, the combined effects of Japanese economic stagnation (including currency inflation), and demographic aging have contributed to a gradual erosion of Japan's dominance in worldwide gaming, and there have been outspoken interviews of prominent

Japanese developers about this. Meanwhile, the US has competed with online and social network gaming, and Apple's rise in mobile smartphones has overtaken an early lead that Japan had with iMode phones.

Asian competition from Korea and China is also significant – both are growing in the games markets at phenomenal rates – and especially Korea has found significant niche in online gaming, having long been a PC-centric culture grown from internet-cafes and LAN-gaming competition. Korea has also been the home to the rise of freemium gaming, which allows games to be played freely, then pay gradually in micro-transactions – this allows games to reach consumers with less money to spend, but still hooks them in profitably. Korea is also one of the most significant MMO markets- massively multiplayer online world games, where players take on the role of an avatar, adventuring online with other players, typically paying a subscription price, and often playing many hours every day. Also in Asia, China's explosive growth in many economic sectors is also beginning in games, with companies such as Shanda and Tencent using local talent to create games customised to the local markets. India is a little further behind in games development – despite a successful software outsourcing industry to Silicon Valley, there are few major players in games in India yet – UTV stands out today, as a national broadcaster with TV and film interests, and several investments in the western games market. India, in common with other Asian economies, is also beginning to create large content-workshops for outsourcing, such as DQ, which have high quality artwork available from low-cost locations. Such companies invest in computing facilities and software, then hire talented individuals and train them intensively on the job. What is notable about Asian companies, is that they are beginning to reach out to western markets, which can be more profitable per head. The typical path to do this is to partner with, then acquire, small but highly respected western players. For example Square/Enix recently purchased Eidos in the UK (creator of the game Tomb Raider) to give it a western HQ, and is now continuing to grow the business with a Montreal studio.

Europe is perhaps best described in a gaming context as diverse. The UK has been a key country in the rise of video gaming since the 80's, when a vibrant home computing market created a generation of entrepreneurs. Since then, several of games biggest global IP's have been created in the UK – Tomb Raider, Grand Theft Auto, Harry Potter, recently Lego Star Wars, and Little Big Planet. Germany, as the largest EU country, with strong engineering, has been under-represented in console gaming though, instead showing strongly in the shooter and strategy gaming markets on PC, continuing a preference for the home computer established in the 80's with Commodore. France has historically been a strong performer in video games too, with large companies such as Infogrames (later known as Atari) and Ubisoft creating clusters in Paris and Lyon, though these have suffered recently, with Atari now headquartered in the USA, and Ubisoft spending most of its investment growth money in Montreal and Shanghai. Italy and Spain are major EU markets, and do have successful gaming companies, but relative to population, the Nordic countries and Netherlands have actually had greater success – most notably recently with DICE in Sweden becoming a major player in EA with the global brand Battlefield.

5.2 Case Study: Global Games Industry Locations

5.2.1 Montreal, Canada

Montreal is currently most prominent growth area in the global games industry, with growth of around 33% predicted in the next year. More than a decade ago, the government, looking at growth in San Francisco and Vancouver, targeted the games and multimedia industries for development in the area, and started the now famous tax credits which initially attracted Ubisoft, then an up-and-coming top 10 player in games publishing. Games made by Ubisoft were of a high quality (Prince of

Persia, Splinter Cell), and so the cluster grew in reputation, and attracted more games companies too.

Today it is host to studios for Electronic Arts, THQ, Ubisoft, Square/Enix/Eidos and many independents, spin-offs and service companies, as well as media production. Each of these locations employ highly skilled developers, and the cost of living is such that there is a good balance for both employee and employer between good salaries and lower cost productions. The tax incentive gives back 37.5% of production costs as a tax credit, and the Quebec government is due to spend $118M on this credit in 2011, up from $100M in 2010 and $80M in 2009.

The employees who have settled in Montreal have been attracted there by growth, which creates career opportunity, and the chance to work on high quality titles. This in itself would not be enough to sustain the sector however. Games often have a 2-4 year development cycle, at which point many employees move on, and the tax credits having been sustained over a decade, have continued to attract new companies and new growth, meaning that employees have been able to stay in the industry, whilst moving companies and climbing the career ladder, without having to leave the area. If this pattern is repeated for, say, 3 game cycles and around a decade, that is enough for a fresh graduate to have established themselves, and perhaps a family, in the area, and this begins to be the foundation for employees to stay permanently. The cross-discipline sub teams that work tightly together on games often stay together afterwards too, even as they move between companies, and may go on to form successful start-ups. All these factors have been in place long enough that most commentators predict Montreal will remain a permanent hub in the games sector for many years to come.

The migration into Montreal has often been a brain drain away from Europe, especially France, since French is the first language spoken in Montreal, and France once played host to a thriving games industry which has recently been in sharp decline. However, English is a perfectly usable only language for employees in Canada - there is a street in the city centre, called Saint Laurent Boulevard, which separates the French and English speaking sectors. Hence the UK games sector has also been a centre of recruitment for Montreal. Apparently the challenge there now is to do with competition in recruitment – especially at senior levels – while the sector has grown quickly, it has promoted from within, but with continued large companies moving into the area, there is somewhat of an overheating effect with supply and demand of staff. So it is clear that the competition Montreal is involved in is twofold: firstly attracting companies; secondly, with the help of those companies, continuing to attract new experienced and qualified staff from other regions. There is also an emigration effect of the Canadian base – European staff find it relatively easy to move into Montreal, and after a few years qualify for full Canadian citizenship. At this point, working in the mainland USA is possible, and there are many anecdotes to suggest that some of the best talent, especially in artist careers, eventually graduates from Montreal to the very top of the US industry for games or film visual FX in San Francisco or Los Angeles.

Montreal medium sized companies run into many more than 50 companies, of which notable names include developers and publishers: Ubisoft, Electronic Arts, Square/Enix/Eidos, THQ, Warner Bros, Gameloft, Bioware. Others: Autodesk (tools), Matrox (graphics hardware).

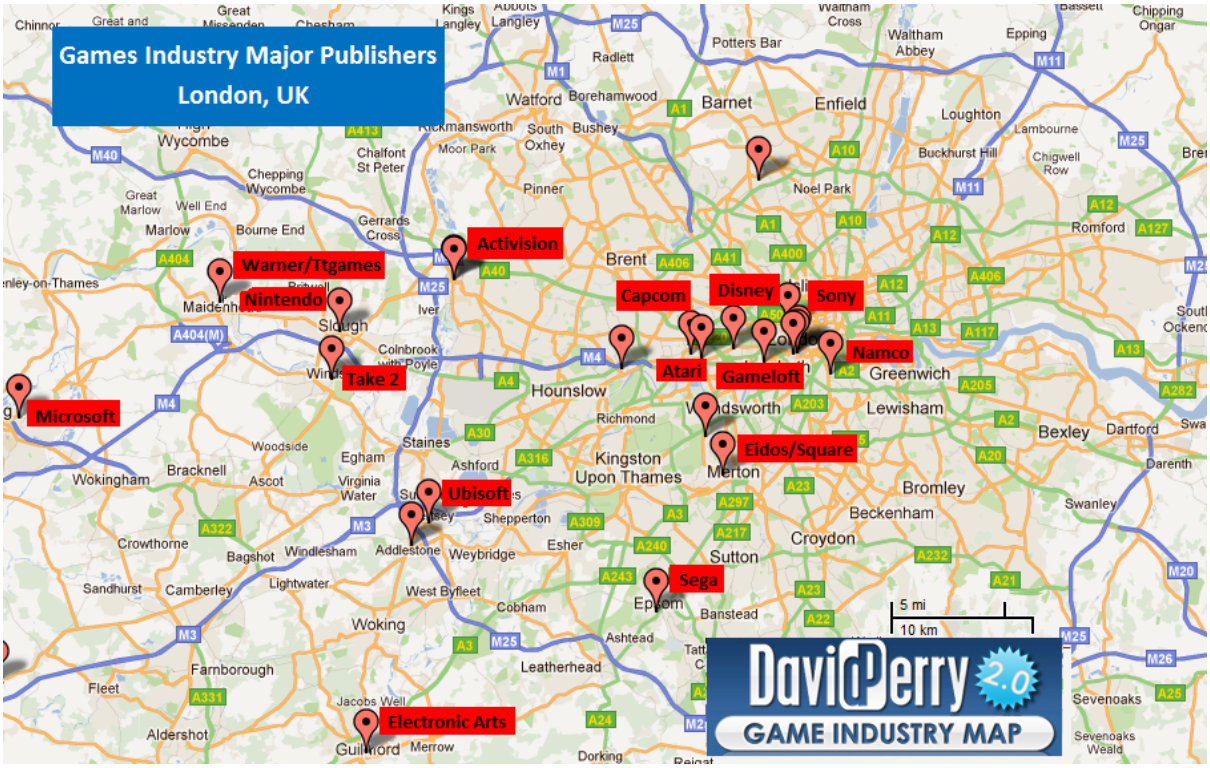
5.2.2 London, UK

London is the largest hub of the UK games industry, and as such the largest hub in Europe too, with around 1500 people employed in the games industry. This area is even more significant if the area is expanded to include Guildford (30 miles), Reading (40 miles), Oxford (50 miles) and Cambridge (60 miles), each of which is also home to multiple games companies. London itself is often the European

headquarters of publishing organisations, hosting business development, production teams, sales, marketing, and distribution management. It is an expensive location, although business is strongly associated with the centre of the city, so that larger companies often choose to locate outside the centre.

The map below (source: David Perry) shows some of the major publishers located around London. Adding all games companies produces too many dots to make sense of the individual cases. It is clear though, that most of the major players have locations in London – and as time changes, new companies such as Zynga continue to be attracted here – they now have a mobile studio near Guildford in the southwest of the map. There is also a healthy services culture in the UK, with QA and Localisation facilities located in lower cost centres (e.g. Sony Liverpool – 200 miles/3.5 hrs away). The London area is also one of the largest internet datacentre markets by volume, despite the relatively high costs. This is partly due to excellent transatlantic links, the large financial centre, and the (sometimes irrational) locality of other industries buying locally. In fact, some apparent London internet hosting is actually reselling of space in the Netherlands, which is cheaper and even larger for this industry. Finally, looking at the supply chain for games technology, the UK is also involved with the mobile boom through processors (ARM computing in Cambridge) and graphics technology (Imagination/PowerVR in London) – these two chip designs are a key part the technology behind the majority of smartphones and tablet computers. London itself is also host to one of the highest quality film visual FX communities in the world, based in central Soho, and employing 1000's of creative experts in art, production and technology. This industry has had notable two-way crossover with games, providing career options to people, as well as sharing know-how and skills between the real time graphics (games) and rendered graphics (film) markets, which are closely related.

In the last few years, the UK has lost its status as the third largest country involved the game industry (US is number one, then Japan), as Canada has overtaken it, and recent data shows that Korea and China will soon follow. In 2011, industry group TIGA estimates an ongoing 9% decline in the UK, and has campaigned for tax credits to help compete with the Montreal incentives and slow the brain drain effect. This campaign was included in the previous Labour government's final Budget, and was then cancelled by the new Coalition which cited budgetary constraints from the global economic crisis. However, in the last few months, the government has extended R&D tax credits, applicable across a wide range of industries, to apply to a wider scope of games production. These credits have previously been heavily bureaucratic to administer, and have, in practise returned perhaps 2-4% of production costs, depending on how companies have been able to structure their expenditure. It remains to be seen how the new rules will help in practise, but they certainly still fall a long way from being competitive to Montreal. Ironically, during the same financial crisis that has denied industry assistance, the foreign exchange markets have devalued the British pound substantially, from a high of $2.10 to more recently around $1.60. Since finance and publisher companies are often based in the USA, this 30% cost saving has once again made the UK competitive on a run rate basis, and the skills and experience levels remain high.



As can be seen on the map, London hosts most of the major games companies in the world, usually for their European headquarters – though Electronic Arts moved their HQ to Geneva a few years ago. Notable developers and publishers in the area include: Splash Damage, Rocksteady, Playfish, Criterion, Electronic Arts, Codemasters, Disney, Activision, Hasbro, Ubisoft, Media Molecule, Sony, Lionhead, Microsoft. Other significant companies include: ARM (processor hardware, Cambridge), and Imagination technology (graphics hardware).

However, there has been a notable decline, over the last decade, of games publishers and developers whose worldwide HQ and financial centre is in the UK. Major industry players such as Gremlin, US-Gold, Rare, Bullfrog, Bizarre Creations, Criterion, Lionhead, Travellers' Tales, Media Molecule, and most recently Playfish have all grown organically in the UK, and most were eventually acquired by US (sometimes Japanese) based publishers. Only one major publishing player remains with headquarters in the UK – Codemasters – and it has its HQ in the Midlands, 90 miles north of London, with major shareholders in India. This pattern of acquisition has often led to stronger growth of developers under better funding conditions, but also, over time, tends to lead to emigration of senior staff as promotions are offered at global headquarters, or as remote branches suffer cuts in times of financial distress.

5.2.3 San Francisco, USA

Silicon Valley is established as the home of high technology and venture capital financing. Since the games industry has always been driven forwards by technological progress, it's also been a natural home for the games industry, and has consistently upgraded itself, successfully, at each disruptive transition. From a US perspective, San Francisco with a mostly technological focus, balances its share of the games industry with Los Angeles – more centred on Hollywood and entertainment (Activision, THQ, Zynga), and Seattle (Microsoft, Nintendo, Valve, Bungie) – more centred on software development. Today San Francisco is host to major players including Electronic Arts worldwide HQ – still the largest games publisher/developer in many markets, and Sony Computer Entertainment

America – where the President of that Sony division is located, though Sony has regional headquarters in Europe and Japan too, with Japan being the overall corporate HQ beyond gaming.

As the home of technology, San Francisco is also host to Facebook, Google, and Apple, each of which are driving the games industry in new directions with social networking, smartphone gaming and tablet computing. The supply chain is here too, with NVIDIA, Qualcomm and Intel representing just some of the major pure play computing companies that also service games technology. Even Microsoft, who have traditionally been based in Seattle and seen as aloof to Silicon Valley, have given in to the draw of the engineering talent base, and have software development facilities in the valley (though not directly games related). Silicon Valley has a further major advantage in innovation – the startup friendly culture, with many angel-investors, venture capitalists, and an attitude that admires and rewards risk taking. Fast failure, in entrepreneurial terms, is a business advantage for those that can learn quickly and move on quickly. This is in extreme contrast to other worldwide cultures that condemn failure and stigmatise bankruptcy, effectively stifling innovation, which requires several risks to be taken, of which the majority will fail before one gem succeeds and pays off more than the failures cost.

San Francisco is, like London, a prominent centre for film visual FX, most famously with Pixar (Toy Story, Cars, etc., now part of Disney). Notably, the LucasFilm/LucasArts/ILM (Industrial Light and Magic) is also a world renowned centre for visual FX, tracing its heritage back to Star Wars, and is now a combined campus facility in San Francisco (with a second centre in Singapore), illustrating the combined vision that Lucas have for the skills of high quality 3D graphics arts and technology serving both film and games. This synergy is forward looking in a visionary way, as games have always been evolving higher and higher quality visuals, but have not yet reached the photo-realism that we now take for granted in visual FX. Such an evolution has many challenges to solve, including the economics, the knowhow, the computing power, but there is no doubt that games will continue in this direction.

Companies located in San Francisco are too numerous to count, with many start-ups and spin-offs continually churning below the radar. The major players are notable, in development and publishing: Sony Computer Entertainment, Electronic Arts / Maxis, Activision, Eidos, LucasArts, Sega, Ubisoft. Other notable players: Pixar (film/VFX), Lucas (film/VFX), Intel (processors), Qualcomm (processors), Apple (iPhone/iPad/Mac), Facebook, NVIDIA (graphics), On-Live (cloud gaming).

5.3 Case Study: UK and Europe based Games Education

In this section we will review courses covering computer games development skills across the different industry disciplines. We have selected a representative cross section, and stayed mostly within the UK, since courses here cover most relevant areas. Three of the institutions are elsewhere in Europe however – France, Ireland and Denmark.

- There are circa 100 different games courses offered in the UK (from 80 in 2008), most of which are at the undergraduate level, and about 20 at the Master level. Most course are split between programming major and design/art major.
- Different types: Most courses are offered via the public education higher education system: 3 to 4 years BSc and BA, with or without internships, and 1 to 2 years MSc and MA also with or without internships. Some private courses are also available. Most Masters level course have been introduced in the past few years.
- Online vs. Onground: Most course are offered the traditional way, on college campuses. Very little in terms of on-line courses thus far.

- Private and Public: usually offer a degree with a specialisation
- Some courses are recognised by professional associations (TIGA, BAFTA) or governmental ones (Skillset).
- The most successful programmes have strong ties with industry professionals.
- Some colleges explicitly team up with game companies.
- Entry requirements: relevant professional experience can replace a relevant BSc for some master degrees.

It remains unclear that undergraduate specialised degrees are better for graduates than computing or science degrees from top schools (e.g. Computer Science BSc degree at Imperial, versus Games BSc at Kingston). However, a focused Master's degree in addition to a good undergraduate degree seems more likely to open doors to employment, a model followed by Goldsmiths (University of London) and Trinity College Dublin, which are covered below.

What mix of resources do they provide to the gaming sector?
Degrees either at undergraduate level (3 or 4 years with internships) or Masters levels (1 to 2 years). Most courses are split between programming and games design and production. Some are recognised by TIGA (games industry association), some are recognised or further accredited by Skillset (government sponsored education body). Some courses include direct links with industry professionals (as adjuncts, members of advisory board, guest speakers). The better courses also have dedicated games labs spaces.

Who do they currently service in the gaming sector?
Information on which companies are actually hiring these graduates is hard to find. Interns tend to get a first job offer from the studios/companies who offered placement. Most companies conduct exams (programming, maths) at interviews. Portfolios of games and software projects also play a key role. Schools tend to serve local companies/studios (e.g. Abertay for Scotland, Goldsmiths for London).

The Demand for Highly-Skilled People is on the Rise
In the UK alone, according to Develop Magazine (July 2006), hundreds of games development jobs were unfulfilled in studios and development companies for a while, and the situation worsened with the arrival of the next generation of game consoles. There was "almost zero staff with next-gen[eration] console experience" at the time, according to Ed Daly, Head of Kuju in Brighton; and the UK did not "produce enough computer science graduates to go around, but did produce artists with limited career options."

This indicates that teaching organisations have to follow trends, hopefully be ahead of the game, and for example introduce modules on new leading technology, e.g. nowadays, LLVM, http://www.llvm.org/ and Clang for compilers for mobile platforms.

Opportunity for Malta: Be more reactive than the competition. Seek constant advice from Industry leaders.

Multi-Disciplinary Research is Needed
According to a number of games development "gurus," such as Craig Lindley (Gotland university, SE), Harald Riegler (Managing Director, Sproing Interactive Media GmbH, Wien, AT), Malte Behrmann (Managing Director, politics, GAME e.v., Federal Association of the Developers of Computer Games, Berlin, Germany. www.game-bundesverband.de), we are standing at the watershed of a new era in

education and gaming, where multi-disciplinary research and development need to be put forward to address a number of more and more pressing needs:

A number of areas in gaming are barely developed, such as narrative, design (of games, virtual environments, interfaces, etc.) and social impacts.

Asset creation, i.e., in particular 3D data production, needs to be moved away from "vertices manipulation" toward more natural manipulation of forms (as artists would do).

Novel generative and procedural technologies are needed to make more efficient the work of developers and reduce the demand on artists by saving man hours work.

Industry and Academics need to talk/interact more.

Games need to benefit from research in Cognitive models as the emerging social context is that a "new generation of pupils/students is less and less text-friendly (reading books, etc.)."

This opens-up the possibility to re-invent education/training/teaching:

"Rather than adapt game technologies to the present ways of teaching, educating, we should re-think education using games." (Craig Lindley at a "Game development technologies and networking" workshop), held in Brussels, April 2006.

Opportunity for Malta: Design games teaching which incorporate above features.

A New Era in Games on Mobile Phones
Mobile phone makers have introduced in the last few years a new generation of devices which will incorporate significantly more powerful graphics hardware and displays. Together with this next generation of mobile phone hardware is the introduction by major players, such as Nokia in Europe, of software environments dedicated to games development: e.g., the Nokia Play application, Android by Google/Motorola, and Apple platforms (leading the market now with Android).

Opportunity for Malta: Few, if any of the educational organisations surveyed specifically target programming and design for mobile platforms, including smart phones and tablets.

5.3.2 INSTITUTIONS

Goldsmiths, University of London, England
Dept. of Computing

At the undergraduate level teaches an option 'creative computing' which gives elements of graphics, mobile games and design. Programming is mainly based on Java or Processing although elements of C++ may be covered. Students may develop a small game, typically on a portable device for their final project.

http://www.gold.ac.uk/ug/bsc-creative-computing/

At the postgraduate level, a focused master's degree is offered, the MSc in Computer Games and Entertainment, with shorter versions offered as PG Dip. (8 taught modules) and PG Cert. (4 taught modules in programming, maths and graphics).

www.gamesgoldsmiths.com

This MSc prepares students to enter mainly the games industry at junior programming levels. It can also serve to enter students into the film post-production industry or visualisation fields. The course is strongly influenced by the games industry running a regular seminar series inviting industry players, offering a successful internship program to their finishing students over the course of a Summer term, which typically leads students to get a job offer upon graduation. The course is taught by a core team of six lecturers half (3) of which are active working in industry. The modules taught cover programming for games (C++ based), middleware, maths and graphics with programming (e.g. of rendering engine), 3d animation (capture and modelling), intro to AI and physics in games (mainly path planning and collision detection). The course also offers a business module which gives a view on the industry, its history, evolution, management practices, and cover some financial elements including project management with spreadsheets.

This MSc Computer Games and Entertainment course, which was launched in 2008, is in the process of getting Skillset accreditation (which is different from simple approval; accreditation is a reviewed government process recognised by the UK industry: http://www.skillset.org/games/). A small dedicated lab space is reserved for the MSc CGE students, which includes a PS3 development kit. Students typically work from their personal laptop. The average intake has been of 15 students, while the target is of raising this to 20.

The MSc offers good links into the Greater London area industries (games, film, visual FX, media).

The course is offered Full Time over one year (October to end of September) or Part Time over 2 years. Some of the course works are team based. Students from the MSc in Computing can elect to take modules of the MSc CGE (usually the ones on programming in games). Also, students on the MA in entrepreneurship part of ICCE @ Goldsmiths can take half their units as part of the MSc CGE when specialising in the games industry (this is a route to prepare students who want to start-up small ventures in media and technologies).

Complementary to the MSc course, the Dept. of Computing @ Goldsmiths conducts research in graphics for games and employs PhD, post-docs or research fellows in projects funded via grants (from the EPSRC, AHRC, TSB, and other organisations).

Abertay, Dundee, Scotland
Institute of Arts, Media and Computer Games (AMG)

http://www.abertay.ac.uk/studying/schools/amg/computergamescourses/

Abertay was the first university institution to offer dedicated games courses in the UK. Three undergraduate and two postgraduate courses are on offer. On the programming side Abertay offers both a BSc Computer Games Applications Development and a BSc Games Technology. Both prepare for entry programming jobs in the games industry; the latter is approved by Skillset and more linked to industry in its content (for programmers jobs), while the former gives a more general background (including e.g. narratology, audio for games). A BA Game Design & Production Management is also offered to prepare for games design, production or management jobs and is even broader in scope, covering some programming, 3D modelling, Q&A, Media law and other related areas.

All three undergraduate degrees are Honours degrees of 3 years plus one extra year (compared to usual UK 3 year BSc/BA degrees). The fourth year includes a major project. Some of the courseworks are team based.

At the Postgraduate level, an MSc is offered over 16 months in duration. The modules are similar to Goldsmiths, focused around programming skills for games, AI, a view of the marketplace, maths. The final project is offered during a regular semester (Autumn or Winter) hence the longer duration of studies. Also offered is a Professional Masters in Games Development, which is mainly focused around a large project (60 credits out of 120) with direct inputs from the local games industry partners Abertay has. This programme requires for entry a good to advanced level of programming (and thus does not explicitly teach such skills assumed as background).

All games courses benefit from a GamesLab with two large areas with computers and desk space for both undergraduates and master's level students. The GamesLab also includes a seminar facility and lecturing rooms and relaxing/social area.

Abertay's AMG also runs during the Summer time the Dare to be Digital programme, a well-recognised international video games development team-based competition.

http://www.daretobedigital.com/

Small teams of circa 5 people with various skills (programming, art, audio) work together under the guidance of mentors from industry for 10 weeks towards the presentation of a game (concept and realisation) on a competitive basis with rewards and good exposure to industry.

This event brings international attention to Abertay from the games industry every year, a great way to advertise themselves and attract good students and the attention of industry.

Liverpool John Moores University
Liverpool, North-West England

School of Computing & Mathematical Sciences

At the BSc level a Games Technology Honours programme is offered, which is similar to one of Abertay's model with a broad overview of games programming and design covered in course content (less focused on programming skills than Abertay or Goldsmiths).

http://www.ljmu.ac.uk/courses/undergraduate/course.asp?CourseId=G450

International Centre for Digital Content

The ICDC runs an MA/MFA in Games Design.

NB: The website (http://www.icdc.org.uk/magames) is down (Sept. 16-7-8).

Bournemouth University - National Centre for Computer Animation
NB: Plans to offer an MSc in Computer Games Technology (programming) in September 2012.

http://ncca.bournemouth.ac.uk/

The focus is on computer animation and in the past Bournemouth has produced graduates who mostly enter the film post-production industry and is the leading UK Institution for film / TV post

production and special effects, but more recently is trying to serve also the games industry (e.g. with the above mentioned plan of an MSc in Games Tech). A range of courses for undergraduates and master level students is offered. Established in 1989, it is one of the oldest such centres.

Undergraduate (Honours) level: BA in Computer Visualisation & Animation, BA in Computer Animation Art, and a BSc in Software Development for Animation, Games & Effects.

Postgraduate level: MA in 3D Computer Animation, MA in Digital Effects and an MSc in Computer Animation & Visual Effects.

Almost the entire content of the courses and modules offered at the NCCA are preparing their graduates to enter the film post-production industry. The games component is more of an after-thought (this may change in the future with the introduction of new courses such as the planned MSc in Games Tech.). For example the BSc covers good programming and maths and graphics background, but the other modules are all centred around animation.

In the field of animation and special effects for the film industry, the NCAA is very well established and takes on board more than 100 people each year. Internship (placements) are offered in most programs and the NCAA is well connected with major industry players, again, especially in the film post-production area. Guest tutors from industry regularly deliver master classes and seminars.

Escape Studios – London, England (private provider)

http://www.escapestudios.co.uk/

Offer many short courses, operates both in the UK and USA. Focus is 3D animation courses, and thus a competitor to Bournemouth and NFTS, and prepares its graduates more for the film post-production industry than the games industry per se.

Current course offer includes: MA Visual Effects Production, with shorter versions offered as PG Dip. and PG Cert. Duration of the MA is 11 months and cost is 22,000 GBP (to compare with university offers which are still at circa 3,500 to 4,000 GBP in most cases for a one year PG degree). Starting dates in mid-September and late March (while universities typically have only one starting date).

Course content is focused on skills, learning the main tools used for special effects (2D and 3D), including: Maya, 3D & 2D visual effects, 2D compositing. A final project concludes the course. Access to professional software is provided: Maya, Photoshop, PF Track, Nuke, Silhouette, ZBrush, HDR Shop, 3D Equalizer. The course is delivered via (7) modules with a mix of taught lectures, tutorials/labs and self-directed study. Tutors are professionals or ex-professionals mainly from the post-production industry. Students have access to studios located in Shepherds Bush (West-end of London); each main studio room is equipped with the latest workstations, digital projectors and wacom tablets, and can host no more than 12 students at a time.

Escape Studios also offers short courses (day, evening, on-line). A typical example, is one of the modules of the MA, on Compositing: it lasts 12 weeks, costs nearly 10,000 GBP, is offered full time, Monday-Friday, 10am-5pm. Six different such 'intensive' courses are on offer.

Although not specifically targeting the Computer Games industry, Escape Studios provides a successful model as private provider of long (MA like) and short courses for the more junior students as well as for professionals who want to add skills to their CV.

National Film and Television School (NFTS)
Beaconsfield, Buckinghamshire, England

http://www.nftsfilm-tv.ac.uk/

Established in 1971 and located close to Pinewood studios.

Offers numerous MA courses linked to film and animation and one MA course on Games and Design Development. Each MA course is accredited via the Royal College of Arts and lasts 2 years. It also offers 1 year PG diplomas and short courses all aimed at the animation/film market.

Regarding the MA Games & Design Development, it follows a model similar to that of Bournemouth, preparing graduates to focus on one of art and animation, design, or production. Programming and software exposure is provided by the NFTS external partners (at the moment, possibly with Imperial College via the RCA). Seminars with tutors from the industry are given to students. The MA is led by Jon Weinbrein who has worked for the BBC, Science Museum, EA, Sony, and by Charles Cecil, founder and director of Revolution Software.

The first year is focused on courses and skills, while the second is driven by briefs/projects, including small team-based projects. Course modules include games design, game art & animation, software development and technology. All students graduating from the NFTS have their work presented to the industry both through the screenings and showcase at the BFI Southbank centre and through specific events. Fees for the MA stand at £9,800 a year (Home Fees) or £20,500 a year (Overseas Fees). This is significantly higher than Goldsmiths one year MSc at circa 4,000 GBP. This MA CGDD will be offered for the first time in January 2012.

Kingston University, London
Computer Science Department

http://www.kingston.ac.uk/undergraduate-course/computer-science-games-programming-2012/

At the undergraduate level Kingston offers a 3 year BSc Games Programming and 4 year version as an Honours BSc where the 4th year includes industry placement. The BSc is focused around games design and programming. Kingston also offers a BSc Games Technology (3 or 4 years honours) which is broader in scope, covering audio in games, games production.

Kingston maintains a GamesLab available to its undergraduate and postgraduate students. It hosts computers, games software, projectors.

At the postgraduate level, Kingston offers both an MSc and an MA (1 year full time, 2 years part time). Fees are at circa 5,200 GBP for UK/EU citizens and 11,000 GBP for overseas.

http://www.kingston.ac.uk/postgraduate-course/games-development-msc/

The MSc Games Development, is focused around games programming and digital content production. Its content and structure is similar to Goldsmiths and Trinity College Dublin. One main difference seems to be that the lecturers are not directly active in the industry. The links with industry seem fairly weak; their main commercial partner is Sony SCEE.

http://www.kingston.ac.uk/postgraduate-course/games-development-ma/

The MA Games Development, does not cover games programming explicitly, and prepares students for art and design position, possibly production as well.

Trinity College Dublin, Ireland
School of Computer Science & Statistics

MSc in Interactive Entertainment Technology: http://www.scss.tcd.ie/postgraduate/msciet/

This is a one year MSc, launched in 2007, similar to the MSc at Goldsmiths in its structure, with the semesters of taught modules followed by a Final Project period over the Summer. Though not in the UK it is important to include Trinity in this section of the report given its rich heritage. The modules offered are more classical computer science courses than specific for games and include: Communication theory, Vision and augmented reality, graphics and rendering, AI and agents, real-time animation and physics. Note that this is the birthplace of the IP Havoc and spin off company from Trinity, the games real time physics engine and it influences the course content. Havoc was bought by Intel in 2007, and today the company offers a prize of 1,000 GBP each year to the best final dissertation. The IET Seminar series brings in graphics researchers and industry people. The intake is of at most 25 each year. Since 2007, Microsoft have sponsored a dedicated XNA Gamelab, featuring Xbox 360 consoles for each student on the programme.

The MSc was created and is co-directed by Steven Collins, CTO at Havoc (2000-5), and now Founder and CTO at Swrve ("providing productivity and optimisation solutions for games").

IT-University of Copenhagen, Denmark
Center for Games Research (CGR)

http://game.itu.dk/index.php/About
ITU has been delivering dedicated games courses since its establishment in 1999. ITU houses the Center for Games Research, which is a multi-disciplinary research group with backgrounds in the Arts, Humanities, Social Sciences and Computer Science. Researchers at the Games Center including Espen Aarseth, Jesper Juul and TL Taylor, have been influential in setting up the field of Game Studies, launching the first dedicated digital game research conference and journal in 2001.

The Center for Games Research at ITU offers the Media, Technology and Games (MTG); an MSc in games split into three specialisations: Design, Technology and Analysis. MTG prepares students for mid to high-level positions in programming, design, project management, writing, QA and analytics. It does not offer entry level courses or art courses such as concept art, 3D modelling and animation. Outside of game industry-specific jobs the MTG programme prepares students for work in games journalism, research and academia.

The MTG programme runs for 24 months and offers courses such as: Game Design, Game Development, Game World Design, Game Engine Programming, Advanced-AI for Games, Interactive

Narrative, Games and Game Journalism, Foundations of Play, and Digital Game Analysis. Students have 6 months to finish a final project which varies in scope depending on specialisation. Analysis students embark on a written research project using theoretical, qualitative or quantitative methods. Design and Technology students work together on developing a game along with a written document describing the process of creation, conceptual rationale for the project and reflections thereon.

The program was developed in consultation with the Danish Game industry, primarily IO Interactive. A number of courses are also taught by industry experts. ITU has two game-labs which host students from all the specialisations with a total of 90 work-stations, each including a machine dedicated to game development and another one for high-end game-play and testing along with a number of consoles in each lab. The Center for Games Research also includes a games room with testing facilities. ITU's library has an extensive selection of digital and board game as well as a number of gaming consoles for students to use.

The Center for Games Research at ITU also started the Nordic Game Jam, which was the inspiration and model for the current largest game development competition: the Global Game Jam. The Global Game Jam has over 6500 participants in 44 different countries. The Nordic Game Jam is still run by ITU on a yearly basis and attracts game developers from all over the world with over 300 participants each year.

Gobelins, Paris, French Arts School
This course is based in France, not the UK, but is notable in being a traditional arts school, which has recently branched out into games courses.

http://www.gobelins.fr/en/gobelins

Offers an Video Games teaching since 2011. Started in the 1960's with courses on photography, and later introduced animation (1975), video (1985), multimedia (1991) programmes.

For games, Gobelins recently introduced a Masters Interactive Digital Experiences.

http://www.gobelins.fr/fi/video

It targets students with either a background in graphic design or programming (engineers). Course content includes: narratology and game design, graphics design for games, games programming, a final project in teams of 5. Targets a yearly intake of 25 people, mixture of programmers and graphic artists. Yearly fees are set at €7,000. The programme lasts one year including a 5 month internship placement in industry.

NB: Gobelins also offers short courses but these do not (yet) cover games.

5.4 Case Study: USA Games Education

In this section we will review courses covering computer games development skills across the different industry disciplines in North America. This sampling of universities includes a wide-cross section of what is available in the U.S. and Canada. Institutions with strong reputations were included, as well as ones that are not as well known. This sampling attests to the wide variety of program offerings and shows how the type of institution impacts the type of game degree offered.

In 2009, the ESA conducted a study that indicated that American colleges and universities are offering more degrees and courses in game design, game art, game programming and game management. Each year there is an increase in the number of programs offered. The ESA attributes this to the expanding role of games in today's world – people are recognizing the broader use of games as more than just entertainment. Games are seen as a tool that can train and educate in all areas – healthcare, education, business, and government. In 2008 there were about 220 accredited universities offering game programs and currently there are 300+ schools in the U.S and 60+ schools in Canada offering some type of game related studies.

With this growing interest in games, it is natural that schools will cater to students who want to pursue a career in game development. Schools are likely to have higher enrolment numbers in some departments if a game development degree or specialisation is offered. The type of degree offered will also impact student enrolment. For example, a school that offers a traditional BA in computer science, but with a concentration in game studies may get a lot of applicants who are interested in learning more about games, but also want to have a degree that can be applied to a broad range of computer-related careers. Students may also be attracted to a certain institution based on what existing connections the school has with the industry, and what other resources are available to help them best find work after graduation.

In the United States, these programs are located across the nation at all types of educational institutions – state schools, private universities, community colleges, and for-profit schools. Students from any part of the U.S. are likely to find an educational institution nearby that offers an opportunity to study game design and development. There are also numerous online programs, which don't require the students to attend classes in a physical location.

In Canada, the schools offering programs are mainly located in Vancouver (which has a few game studios). Montreal, the largest game industry hub in Canada, is very close to New England, an area that has several highly-ranked game design programs.

Types of Institutions

A traditional university offers a Bachelor of Arts or Bachelor of Science degree that takes about 4 years to complete. These universities can be public or private. Public universities offer lower tuition rates for in-state students. If an out of state student attends a public university, they may end up paying just as much for tuition as they would for a private university. Private universities typically cost more money (at least twice as much) and everyone pays the same tuition rates. Students with degrees from these traditional universities are equipped with degrees that can be applied to a broad range of careers in their chosen field of study. Degrees from 4 year institutions generally garner more favourable notice from potential employers, even if the applicant does not have a game specific degree.

Community colleges are significantly cheaper and offer a two-year certificate, diploma or degree. Oftentimes a student will get a degree from a community college and then transfer to a 4 year university to continue on for their Bachelor's degree. Community colleges tend to offer degrees in game development with classes that focus on a particular aspect of programming (Mobile, Networking) or art (3D Modelling, Animation, Level Design).

'For Profit Schools' are privately funded institutions that are managed by profit-seeking companies. They offer a 4 year BA or 2 year degree in game design, development, or management. The tuition costs fall somewhere between the costs of a public and private university. These are very focused

game development programs with very little chance of crossover with other programs or departments at the school.

Online schools have become popular in recent years because of the flexibility they offer. Students can attend classes in an asynchronous learning environment, which means they can better schedule their class assignments around family or work obligations. In addition, since everything is done online, this allows students who are not located near a major gaming hub to take classes, and is also useful for students who are unable to attend on-ground classes for whatever reason. The drawback is that these students must be very proactive about the program material and manage their time wisely so they can complete the assignments in a timely fashion. They also have less back and forth feedback on the work they turn in and thus have to be able to judge the quality of their work with a critical eye.

Specialized Degrees vs. Traditional Degrees

Students with a traditional four-year degree are as likely to find a game job as students with a game specific degree. Employers are mainly interested in finding the talented applicants and bringing them into the company – even if they don't have a specialized degree. A strong art or engineering portfolio is going to be a more significant hiring factor for a game company than a degree. While it is true that applicants who have degrees (regardless of institution) are more attractive to employers – a strong portfolio can and will become a larger factor on whether someone gets an interview. In the game industry, it is common to find people who are self-taught and have a natural ability for the work. They spend their time making a strong portfolio or working on outside game projects that clearly showcase their talent and abilities. When they apply for a position they will stand out amongst the other applicants because of the extra-curricular game related activities they've done, or because of their portfolio.

If game companies are evaluating applicants solely based on educational background and degrees, students with a degree in a relevant subject are more likely to gain a position in a game company. The skills they learned while attaining their degree are usually transferrable to the needs of a game company. This is especially true for someone with a computer science or art degree. The skills you learn in a generic computer science or art program are very similar to the ones you learn in a game specific art or engineering program. While it is good that applicants with game degrees are more familiar with the industry concepts and terminology, this type of specialized knowledge can also be gained once a game company has hired someone. When game companies are seeking entry-level people, they may find applicants with a more generic background to be more attractive since they will not have an established way of doing game–related tasks. Each company has different processes and it is easier for them to teach someone the specific skills needed if the applicant already has the broad skill set and the aptitude to adapt quickly to the working environment.

Applicants seeking a design position may think they have an advantage if they have a game design degree, but so far this does not seem to be the case. In a lecture given in 2007 the Leipzig Games Convention, the Head of European Recruitment for EA stated that at the time of his lecture, out of the 350 new hires EA had made over the past year, not one of them had a game design degree. He was concerned that the game design programs were the cause for declining enrolment in the traditional disciplines of science, math, and physics (areas of study which can be easily transferred to a game development position). Casual interviews with other recruiters indicate they have not found the specialized game development degree to be a significant factor in hiring, and indeed may be a detriment (depending on where the degree was obtained).

Students with a generic degree are able to more easily find employment in other areas (web design, software development, special effects, animation). The skills they learn are easily transferred to games and other careers. This is especially true for computer science and art majors since they are learning standard principles of art and programming that are applicable in any career.

On the other hand, students who specialize in game design degrees - especially at for profit schools - may find it more difficult to transfer their skills to other career areas. The game design degrees are so focused on designing game play experiences, that it is difficult to map how the skills of game design, level design, storytelling, and so on can be mapped to jobs in other industries. Because game designers tend to utilize many different bits of knowledge, an applicant who has focused solely on game design may not appear as attractive as someone who has a humanities degree (e.g. English, History or Philosophy). When it comes to designers, companies are more interested in applicants with a well-rounded background that includes some knowledge of creative writing, history, sociology, psychology, and so on.

The ideal combination seems to be a degree in a traditional subject like computer science or telecommunications with a specialisation in game development. Several universities offer this option and this gives the students the best of both worlds. The students comes away from school with a degree that can be transferred to a wider variety of careers, yet has some specialized knowledge that would be attractive to a game company. In engineering, a game specialisation can be valuable since students theoretically will have a better understanding of different gaming platforms and how to work with high-end game technology (for example, 3D rendering, AI, tools).

The choice of whether a student decides to get a specialized game degree or a more 'standard' degree is influenced by where the student gets admitted into school. Typically, the for-profit universities have lower academic standards for admissions and it is easier for students to gain access to these programs. The for-profit universities are also more active in helping the student navigate through the financial aid process and will help the student secure the necessary funding for the tuition. Similarly, community colleges have a lower barrier to entry in cost and admission requirements. For the students at standard institutions, they have more exposure to other disciplines and there is the ability to work on cross discipline projects. Another factor students consider is what additional resources are available that will help the student get employment after graduation.

Job Placement

Statistics on actual job placement in the industry are not readily available. Full Sail claims a 76% placement rate in the game industry for their graduates. The placement rates for students with game degrees are likely equivalent to others with college degrees in the humanities and social sciences. If graduates are looking specifically at game companies, they do not necessarily have an advantage with their specialized degree.

Students will go on to work for game companies, but it is still very competitive to get a job at a game company even with a specialized degree. Some companies tend to shy away from graduates who have these speciality degrees from for profit schools as there is a general feeling that these programs do not turn out students that are as competitive or can produce work to the level needed, or that they have learned a lot of game specific things that need to be unlearned at a job.

Students with a traditional four-year degree have as good a chance as getting a job at a game company, especially if they have a strong portfolio of work that shows they have the necessary skills for making games. Companies are not afraid to invest in on the job training to provide new employees the game specific knowledge for working on the game development team. Again, this is

an area where artists and engineers tend to fare well since their skills are more tangible and easily transferred.

Students studying specifically game design or game production don't seem to have an advantage over students who don't - it boils down to the portfolio, the interview process, and any game-related extracurricular activities the student has engaged in (even ones outside the educational institution). The game modding community is a good source for new hires (the large games developer id in Texas has made several good hires from their modding community, as has the game developer and game engine provider Epic). For reference 'modding' is where players create their own, in general, multiplayer levels for games, a leading example of a modded game is Counter Strike by Valve. In general, companies are looking for the best of the field and will go wherever they need to in order to find these candidates.

Previous experience, including internship experience is looked up very favourably and will likely set the candidate apart from others applying for the same position.

Financing

The cost for these degrees covers a wide range and is directly influenced by the type of institution. Community colleges offer the cheapest option and run about $70 - $100 per credit hour. An associate's degree is roughly 75 credits so the estimated tuition is about $7500, plus books, software, hardware, and other fees.

The next option is attending a state university as an in-state student. The tuition differs by school, but can range from $10,000 - $12,000 per year. The programs take at least four years to complete, so the total cost is somewhere between $40,000 and $48,000, plus other expenses. An out of state student can expect to pay roughly twice this amount on tuition.

For-profit institutions cost about $500 - $700 per credit hour and to complete the entire program the tuition will be roughly between $80,000 – $90,000.

Private universities are significantly more expensive and tuition can cost from $30,000 to $45,000 per year. The total cost for a four year degree can run from $120,00 - $180,000 plus other expenses.

Students can apply for Federal Financial Aid, scholarships, and grants. For profit schools are especially geared towards getting students to apply for financial aid.

Admissions Requirements

Students come from all over the USA to enrol in these programs. The quality of talent depends on the school's admission requirements. Traditional four-year universities attract a wide range of students, but most have graduated from accredited high schools with decent GPAs (2.0 out of 4.0) and performed within acceptable ranges on standardized entrance exams. Typically ACT scores range from 26 - 33 and SAT scores range from 1200 – 1470.

Community colleges have less stringent requirements and often do not require ACT or SAT scores for admittance. Applicants must have a high school degree or equivalent and will need to submit transcripts. The minimum GPA required can be as low as 1.5 out of 4.0.

For Profit schools also don't tend to require ACT or SAT scores. They may set a minimum GPA requirement, but most will judge students on the portfolio, essay, and submitted application.

Course Curriculums

Educational institutions tend to have different names for the degrees offered, but they can be essentially grouped into the following categories:

Game Design: This degree focuses on the skills needed to design a game, and is one of the most popular degrees offered. Courses include level design, game scripting, character design, storytelling, critical theories, and genre studies. Depending on the school, the game design may also include level building/design or world building design. In this instance, the curriculum will also include appropriate art classes for building and texturing models and using level editors. The final project in this degree usually is some type of game design bible and may also entail acting as lead designer on a group project that completes a playable prototype.

Game Management: This degree focuses on the area of game production, project management, and leading teams. The game management degrees are not offered as often as degrees in the other disciplines. The courses for these degrees focus on soft skills like team building and leadership, and organisational skills like documentation and project management. The game production degree offers skills that can be transferred to other industries since the degree emphasizes basic principles of project management and team organisation.

Game Art: This degree is as popular as the game design degree. The courses focus on 2D and 3D art creation, including textures, modelling, rigging, animation, cinematics, and level design. The skills learned with this degree can be easily transferred to other areas. A final project for this degree is centred around completing a portfolio that can be shown to potential employers. The student may also end up working as an artist on a team creating a playable prototype.

Game Programming: This degree specialisation is not as prevalent as Game Art and Game Design degrees, possibly because the core concepts / skills of computer programming are the same regardless of industry. Most game programming degrees are comprised of a traditional computer science degree with a specialisation and game programming. The specialisations may include topics such as 3D rendering, mobile platforms, or game technologies. The final project for this degree usually requires the student to code playable game prototype either as part of a group project or own their own.

Hybrid Degree: The most common 'hybrid' degree is one that combines game art and design. With this curriculum students will focus on both principles of game design (storytelling, game mechanics, scripting) and game art (2D and 3D art, level building). The final project will be focused around creating pieces for an art portfolio, designing and game, and perhaps working on a group project.
Students attending a traditional 4 year university or a community college have a great chance of doing cross-discipline work with other departments. There is more opportunity for cross-discipline work since people are studying such a wide range of subjects. Many schools pollinate across the computer sciences, art, and communication majors so that all aspects of the game development team can be easily represented on group projects. This is another reason why traditional universities may offer a more attractive pool of applicants to potential employers.

Students attending a For-Profit School have little exposure to other disciplines and often are not exposed to anyone outside their chosen program. For Profit schools have clearly defined course requirements and will often dictate to the student what sequence the courses are to be taken. There is little choice for the student within the bulk of these programs – save for the ability to pick what classes are needed to fill a few elective courses.

See the document entitled 'Appendix Course Offerings' for more information on the actual courses offered by each school.

Technology and Coursework

Schools approach the coursework in a variety of ways. Some schools rely heavily on documenting of game ideas and developing a suitable portfolio for potential employers. The students will routinely write up game design documents and create 2D and 3D art assets suitable for games. If the student specializes in one area (3D models, textures, concept art) the portfolio pieces will be geared to showcase the best work in these areas. This approach is prevalent in the programs that focus specifically on Game Art.

Most schools also expose the students to some type of level editor – with Unreal being one of the most popular. Students may be required to work together with a group to develop a level and gameplay using Unreal or some other type of game creation program such as Flash or Game Maker. This culminates in the creation of a final project that is a playable game or prototype. USC, DigiPen, and Full Sail are examples of institutions that require this type of work for the final project. Students will work in groups on this project with each person taking on some type of lead role (lead design, engineering, art, or production).

The importance of a simulated game development experience is noticeable in most of the game programs. The students will work in some type of group setting for a few weeks or a few months , with the goal being to provide students an opportunity to get some experience working with a game development team. It is understandable that students will get as much out of this experience as they put into it, and in some cases a few students will carry the brunt of the work while others do not pull their weight. These breakdowns will have an impact on the final project and the decrease in quality will be noticeable.

Schools do have some type of mixture of general education courses and game specific courses for these programs. One notable expectation is Vancouver Film School which allows students to get their degree in one year. In order to accelerate this program the non-game related classes are not as prominent. Traditional Universities and For Profit schools that offer a four year degree do require the students to fulfil some general education requirements (humanities, maths, science) along with whatever classes are needed to complete their major.

As can be expected, programs focusing on game programming are mainly comprised of programming course work and have the students creating code for small game projects, working on prototypes, and learning to apply new technologies to their work. The student may work with game specific tools such as Microsoft's XNA tools or any one of a number of 3D engines. Popular choices include Unreal (there is a free version for students), Unity (special pricing for educational institutions), and Torque (educational pricing). The programming language is usually C++ with an emphasis on Microsoft Visual Studio. Students may be able to choose an elective that allows them to focus on other technology such as mobile platforms (Android, iOS, Flash).

For example, here is the list of technologies utilized by the game program at MSU:

- Unity 3D as the 3D game engine
- Adobe Flash as the 2D game engine, multimedia authoring and rapid prototyping tools
- Microsoft Visual Studio for coding on Windows
- Apple Xcode for coding on Mac OS X and iPhone

- Autodesk Maya and Blender for 3D modelling and texturing
- Adobe Creative Suite for image creation/manipulation and interface design
- Apple SoundTrack Pro for sound editing and music creation
- A number of open source and freeware tools, such as the Quark level editor.
- Specialized tools such as the Unreal Editor.

From an art perspective, students will learn some type of 3D art package – 3DS Max or Maya. Both seem to be equally available, and the choice really depends on what the program focuses on. 3DS Max and Maya are both heavily used in the industry and theoretically students should be able to apply the concepts of how to use 3D programs to either Max or Maya and so focusing on one or the other in school shouldn't be a huge detriment when applying for game jobs. The Adobe Suite of tools is also a predominant software package – specifically Photoshop and Premiere.

Most schools have a mix of humanities and technology that is studied as part of each program (including ones that are focused on game programming). They see it necessary to blend together the creative and technical aspects of game development and to provide students with a well-rounded experience.

Industry Connections and Other Resources

Most institutions that offer game programs have connections with the game development community. Many cultivate relationships with the local game development community and will have developers come in as adjunct professors or special guest speakers. Most of them have former game developers from well-known game companies who serve as full time instructors. Many schools have an advisory board that is comprised of current industry veterans from all areas (design, engineering, art). The faculty of some of the more reputable programs are very accomplished and respected in their fields.

At a minimum, schools will offer some type of extra-curricular game club (usually run by students) where like-minded people can meet and work on game projects together. This is often where students will make connections to each other and agree to work on a prototype or game mod together. For example, students may use the club as a way to create entries for the Global Game Jam (hosted by the IGDA) or submit an entry for any of the numerous game development contests that are available (for example, the Independent Games Festival aka IGF).

Many schools have resource centres or game labs that focus on the intersection of media and technology. USC has the Annenberg Innovation Lab and Champlain College has the Emergent Media Center. Both of these centres offer students the opportunity to work on interactive and multimedia projects with other students, research fellows, and professors. Gaming Labs are also a common resources – the labs feature state of the art hardware and software and are available for students to utilize in creating games.

Schools also rely heavily on the game community to provide internships for the students. USC has strong connections to EA and an inside track to the internship program. Other schools may not have such a strong connection to industry internships, but do provide the resources to help the students locate and secure an internship (especially when college credit internship is necessary to complete the program).

Schools also will sponsor game development conferences and contests for their students. DigiPen is a sponsor of the Game Education Summit and MSU hosts the Meaningful Play conference. This is a good opportunity for students to come into contact with academics and game industry professionals and learn more about the game industry and the broad application of games.

4.5.1 COURSE CONTENT

See the report appendix for sample course content and curriculum as taught at these institutions.

TRADITIONAL FOUR-YEAR SCHOOLS

University of Southern California
http://interactive.usc.edu/about
Location: Los Angeles, CA
Degrees Offered: BA, Interactive Entertainment; MFA, Interactive Entertainment (3 year program)
Tuition Rates: $45,000/year (tuition only)
Admission Requirements: ACT 33, SAT 1470
Total Enrolment: 45,000
Resources: Strong ties to the game industry. Partnership with EA. Annenberg Innovation Lab (cross-discipline that explores relationship between technology and media).

Michigan State University
http://tism.msu.edu/game-specialisation
Location: East Lansing, MI
Degrees Offered: BA in your major, MA in Serious Games
Tuition Rates: $12,000/year in-state; $30,000/year out-of-state
Admission Requirements: ACT 27, SAT 1280
Total Enrolment: 47,000
Resources: Offers specialisation in Game Design and Development (brings together students from Telecommunication, Information Studies and Media, Computer Science, and Studio Art). Hosts Meaningful Play conference.

Champlain College
http://www.champlain.edu/Undergraduate-Studies/Majors-and-Programs.html
Location: Burlington, VT
Degrees Offered: BA, Game Art and Animation Major; BA, Game Design Major (Portfolio Requirement); BA, Management of Creative Media with Specialisation in Game Production
Tuition Rates: $30,000/year
Admission Requirements: ACT 26, SAT 1200
Total Enrolment: 2,400
Resources: Connections to study in Montreal (location of EA and Ubisoft studios); Emergent Media Center, a game studio that offers students paid positions to work on a variety of interactive projects for clients like America's Army, The City of Burlington, and United Nations Population Fund.

COMMUNITY COLLEGES

Wake Technical Community College
http://cet.waketech.edu/sgd/sgd.htm
Location: Raleigh, NC
Degrees Offered: Game Design and Simulation
Tuition Rates: $67/credit hour
Admission Requirements: High School Diploma or equivalent, transcripts.
Total Enrolment: unknown
Resources: Industry guest speakers, internships, located in a gaming hub in North Carolina. Sponsor of the East Coast Games Conferences.

FOR PROFIT INSTITUTIONS

Full Sail
http://www.fullsail.edu/degrees/game-development-Bachelor's
Location: Orlando, FL
Degrees Offered: BS, Game Development; BS, Game Art; MS, Game Design
Tuition Rates: $768/credit hour
Admission Requirements: Based on student application
Total Enrolment: 5,000
Resources: Website claims 78% placement rate for game design graduates; 5-month dev cycle on the Final Project combines students from all three programs in different roles;

Art Institute Pittsburgh, Online
http://www.artinstitutes.edu/pittsburgh/admissions/catalogs.aspx
Location: Online (although students can also attend school On-ground in Pittsburgh)
Degrees Offered: Game Art and Design Degree (4-year); Game Art and Design Certificate (2-year)
Tuition Rates: $500/credit hour (must complete 180 credits for Degree, 90 for Certificate)
Admission Requirements: Based on GPA and student application/essay
Total Enrolment: unknown
Resources: Student can focus on Art or Design. Guest speakers from the game industry. Student chapter of the International Game Developers Association (IGDA).

Vancouver Film School
http://www.vfs.com/programs/game-design

Location: Vancouver, BC Canada
Degrees Offered: Game Design program (1-year)
Tuition Rates: $33,000
Admission Requirements: Transcripts, essays, letters of recommendation; no ACT or SAT
Total Enrolment: unknown
Resources: unknown

DigiPen
https://www.digipen.edu/academics/degree-programs/ba-game-design/course-sequence
Location: Seattle, WA
Degrees Offered: BA, Game Design (focus on design/art); BS, Game Design (focus on programming)
Tuition Rates: $620/credit hour (~$12,000/semester, plus fees)
Admission Requirements: 40% of applicants are accepted; average ACT 30, SAT 1350
Total Enrolment: 1,000
Resources: Based in Redmond, WA, with strong ties to local industry; rents buildings from Nintendo; utilizes Unreal Technology. Sponsor of Game Education Summit.

5.5 What mix of Resources does the Gaming Sector Use?

5.5.1 Consumers

Great creators start as passionate consumers. One of the key cultural advantages for the west was early adoption of games playing by large sectors of the audience. This occurred in the early 80's, and particularly in the USA and the UK. At such an early time in the evolution of computers, programming was relatively simple to learn, and enthusiasts built industries for gaming which led to accidental

millionaires as gaming took off. Talking to senior industry figures today, it is common to find that their personal story started as a hobby, and then was consolidated via either formal education or engagement in a community of likeminded individuals. As companies grew, the influence of the local games market continued to inform the creatives working there. This is seen clearly in Germany, which for years has surprisingly lagged in its ability to create console games – less surprising in the light of Germany as a PC-centric market which also sold many fewer consoles than would be expected. In recent times, with the rise of PC casual gaming and flash, Germany has immediately done well, e.g. with Bigpoint being the major player in the new Hamburg cluster.

Consumers are also, obviously, a great source of local income. Most games are global, in the sense that expensive production values lead directly to higher quality titles. But local markets have always been important, since they are easier to reach, easier to understand, and even in language terms, games can become successful before undergoing localisation costs and export complexities. The modern world of digital distribution still offers developers the ability to stage rollout globally, and this continues to be highly significant. Angry Birds, the best-selling smartphone and tablet game from Rovio, started as a slow burning niche hit in Nordic territories on the app-store, before gradually rising to conquer larger territories one-by-one. It is potentially much easier to get to the top of the charts in one localised territory, before competing in, say, the USA, and that initial chart success becomes a strong advantage in reviews and reputation, helping the title stand out from the noisy marketplace. Angry Birds also benefitted from consumer feedback, and constantly evolved to add new levels, getting better and better as a product while it grew in global reach. This evolutionary process is important for digital releases – 'going wide' too early can permanently put customers off if a global release of a product is unable to deal with a spike in demand, or has simply got too many early bugs. Games are particularly prone to this problem, as gamers rush in to play titles on release day, hoping to get a competitive edge. The internet traffic spikes experienced with gaming are extreme relative to other forms of e-commerce, and perhaps best compared to major TV events such as sports finals. These spikes have in the past led to controversial teething issues for games even from major players, such as EA, Valve and Blizzard.

Cultural fit is another dimension of having a successful consumer base. Starting with native language, global entertainment preferences have often been highly influenced by the USA and hence English speaking countries have had an inherent advantage. In early games, the more abstract nature of characters helped bridge this divide, with Japan in particular being an early leader in games consoles, and characters such as Mario and Sonic managing to appeal globally – it was a highly visionary choice to make Mario a lovable Italian plumber in the 80's, when he was just a few pixels wide and only 16 colours. Today's Mario faces different characterisation problems though, just as movies went from silent to talkies, so games are requiring more dialogue. This cultural fit means that games continue to appeal to local markets first, and hence the USA, as the largest single market, is a real benefit to companies located there. Europe, as a whole, is the second largest territory for most global games, and in order to crack that market successfully, games must be localised, with text and recorded voices, in up to 20 languages. Putting in the effort to do localisation well leads to up to 50% greater sales for major publishers. So the service industry for localisation is important, and typically based in low cost regional centres, such as Madrid/Spain and Eastern Europe.

Meanwhile, film is known to have created several important local markets, such as Bollywood, where lower costs of creation combine with a large local market and distinct cultural preferences to create a thriving industry. This is seen in games, where Japan in particular has a local industry, with many titles that are considered too Japanese to export, alongside a global industry. Despite blockbuster games being cheaper than film, cheap films are still easier to make than cheap games – in part because of the nature of software engineering. These barriers are reducing however, and as off-the-

shelf game engines allow localised modifications, it is possible we will see more localised games succeed. This is a risky play for the global publishers though, and history is littered with anecdotes of games attempting to play directly to European markets failing to catch on. What has happened though is the transfer of IP (intellectual property) from books to films to games, e.g. with Harry Potter recently being written in the UK, filmed in the UK, and games made in the UK, backed by USA based companies (Time Warner and Electronic Arts). Such a territorial success is by no means common though – the Lord of the Rings series was written in the UK, filmed in New Zealand, and games done in America. Even sports games, which often have a regional bias, can be designed in counter-intuitive territories – the world-leading FIFA series of football games from EA-Sports is created in Canada, which has more of a culture of ice-hockey, despite football being the premier sport worldwide.

5.5.2 Talent

Talent is the number one issue for games companies.

Talent isn't created overnight, neither is the aspiration and opportunity that nurtures it. Games have a unique advantage over other forms of software engineering, in that many players have become interested in them first as a pastime, before going on to learn more about how they are created, and getting absorbed into the communities that create, modify and build games for fun, and eventually for profit.

Consumers become talented through education, experience, community participation and work experience. Of these, education is the major factor in enabling talent, and the area which government can have most influence over. Education in the technology industries need not be restricted only to gaming courses, nor computer science, but an awareness of games development and a community to participate in is very necessary to nurture early skills development. Some of these courses are available online, as are some of the communities, but it is notable that successful courses and companies still place a premium on their teams working together, face-to-face, on creative projects. These leading universities therefore offer multiple services to the regions they serve – as hotspots for creating and sourcing recruitment, as generation points for new ideas, and at their best, as places that can interact with local industry to provide unique collaborative experiences and ongoing learning.

Distance of travel is a key question for education availability. While the very top institutions and companies will continue to attract people from across the world, most people choose universities nearer to their home, both travel wise and culturally. On graduation, students often move a more significant distance to work in companies, but most successful universities can point to spin-off start-up companies locally, which continue to hire employees from the same courses as the founders. Local recruiting is very important to companies, since the cost, effort and scale needed to go further away quickly leads to diminishing returns. A company local to a university is more likely to be able to hire interns and vacation-students as workers, and perhaps volunteer to guest lecture at the university, leading to two-way beneficial relationships. We found that games hubs in Europe and USA consistently offer great and relevant university courses.

Scale of the talent base is important too. As studied above, London is a global centre which attracts talent by the lifestyle – and that talent frequently comes from around Europe and the commonwealth. Importing talent, through immigration and lifestyle motivation is key to high growth rate companies and specialist roles. The European Union is a great talent base here, larger even than the US market, and growth of areas, such as Montreal, causes the competition for talent to even cross the Atlantic, with several recruiters advertising their services explicitly in this regard. Supply and demand of talent is most visible in Montreal, where it can be argued that the supply of financial incentives is running

ahead of the supply of talent, causing aggressive company recruitment to drive immigration of talent in a significant way.

Employees are the talent and they want specific things too from a personal point of view. Lifestyle and culture are really important to the young, intelligent, active and mobile developers typical of the games industry. Climate often enables the valued lifestyles – e.g. Skiing near Vancouver, or roller-blading in Los Angeles – although many developers get into the local activities after moving into an area. There are the usual playoffs between lifestyle, living costs, and activity locations too – developers in the London area frequently choose to work in central London and commute in from the suburbs (typical commuter lifestyle), but there are also plenty of cases of people living in London and commuting out to games companies in the suburbs – e.g. Guildford and Reading. Top talent is even more elusive for games companies – the very best can often pick and choose both their employer and their area if they are prepared to move around – this has led to some individuals crossing distances as great as the Atlantic, or from Europe to Asia, several times during a high profile career. Such people become part of a global community of experts, but on a more local level, community is really important to creative industries, gaming and start-ups. Successful games industry hubs typically have strong communities of people who have worked together, informally sharing knowledge and opportunities, and sometimes formally facilitated through industry bodies such as IGDA or TIGA.

Long term prospects and career opportunities drive migration most directly though. The games industry rises and falls over time, and even talent that wants to stay in an area must eventually move out if the companies do not survive. Company stasis is not enough in a changeable area like high technology – companies must compete and grow to survive alone. This growth also generates career opportunity, which is necessary to retain staff while giving them the individual mastery in their crafts to which they typically aspire. Finally, an area like Montreal will succeed in the long term as young graduates settle down and have families, and perhaps decide to stay in the area, valuing education at all levels for their growing families.

5.5.3 Environment

The games industry takes for granted the usual business environment needs – offices to work in, homes to commute from, good travel facilities (public or car). As mobile mid to high range earners, the commuting cost is sometimes less important than the lifestyle options – there are plenty of examples of software engineers in games travelling more than an hour each way to work, simply because they want to stay in games, rather than move to other software industries.

Technology environment is important though. This starts with great internet access, which employees expect at home (for playing games and accessing the web) and at work. Hosting for servers, both inside buildings, and local and global scalable hosting for publishing and online-gaming is also important – but such facilities can be purchased in a global marketplace.

The ecosystem, of supply chain, is a global thing for games, with European companies frequently making deals with Hollywood for IP (intellectual property) access, and hardware and software companies based all around the world. However, sales of these expensive services are still usually driven by demo and face-to-face conversations, so there are examples both of regional sales and support, and of companies deliberately relocating to be nearer to their partners, or perhaps just nearer to the best airport connections. Hosting partner visits is also important for generating the right impressions – publishers typically travel to visit developers onsite, and great care is taken by the local company to recommend hotels appropriate to the visit. Both high end luxury hotels, for deal making executives, and reasonable budget hotels, for regular staff visits are a requirement.

The games industry is often located together with sister industries – e.g. film, TV, visual effects, software engineering, and a cross over for talent is often seen here too, in exchanging know how and employees, over several years. Some areas, such as Montreal, eventually overheat due to shortfalls in available staff and poaching battles between companies have been known with associated litigation. Other areas, e.g. the north-east of England, have formed employer groups, encouraging communities, and with a more gentle approach to recruiting – for example gentlemen's agreements that it is better to poach from outside the area, and let natural churn provide the turnover within an area. This has been aided by networking events run local organisations such as Games Horizon (based in Gateshead) and Games Republic (part of Screen Yorkshire based in Leeds). This works because an area is really competing on the international stage, but can damage itself by overheated local recruitment battles, both in increased turnover and wage inflation.

5.5.4 Legislation and Finance

Companies live and die by both their profitability, and the cash flow en route to those profits. Games companies are no exception, and often run the R&D style model, requiring risky investments that run from 6 months to 6 years before seeing revenue. This makes financing, margins and risks vital aspects to manage for a successful player. On publisher financed games, the developer may often be running a tiny profit or loss (+-5%) during product development, hoping that royalties on a game release will be the big pay out.

So corporate tax incentives, especially based on production costs, can be a significant issue here. At 37.5% tax credits, Montreal's contribution to the production costs can be seen to be massively more significant than the run-rate profit that a developer might otherwise make. And clearly, that funds R&D type projects, which for great developers might eventually pay-off with huge, taxable profits. The games industry has typically grown on enormously profitable titles – in the early 90's, a 6:1 ratio of revenues to investment was a common goal for games from large publishers. However, today's console markets are much less profitable on aggregate, so many titles eventually make a loss.

Several industry figures interviewed for chapter 6 noted that tax was only one factor of managing cost though, and that you can't cost manage your way to a hit. The point being made was that taxation and enterprise incentives cannot be offered in a vacuum – they are the icing on the cake, but talent is required as a fundamental before a company can be built.

Individual taxation, for employees, is clearly another aspect to the balance between company profits and individual lifestyles. This is set against the local cost of living too, but the obvious learning from London is that individuals in the industry continue to accept high taxation and high cost of living to have the London lifestyle and to participate in that business community.

Share options tax and dividend taxation are niche issues that can affect games companies too. Share options are a key pay out for early employees in start-up companies that might sell out to larger players, and dividends can be huge for the directors of successful start-ups.

Other legislation that is relevant to games companies is in intellectual property laws. Games are based mainly on copyrights and trademarks, which are well understood under European, USA and global law. Piracy issues in games are actively chased against copyright violators in many parts of the world, but the games industry continues to suffer from piracy, even though legal second-hand sales are increasingly quoted as also damaging by lost revenues to developers. A more controversial area of law is patents though. Typically, patent lawsuits in gaming are fought between either large competing companies (e.g. tablet/smart phone industry between Apple v. Samsung and Oracle v. Google), or between so called patent-trolls and cash-rich games companies. Patent reform is very

much discussed in the software world, since most large companies have to put aside considerable resources in time, effort and money to defend these cases. Legislation on patents is discussed and lobbied for at a US-wide and EU-wide level, and this is a hot topic for the technology industry.

Age restrictions are another area relevant to games. As an open media, games are host to subject matter suitable for 3 year olds, up to mature titles, with violent and sexual content appropriate for 18+ only. The games industry typically self-regulates age ratings with systems such as PEGI, but shops are bound by different legislation in different territories regarding their duty to not sell age restricted materials to minors. Midrange, there is emerging best practise for children online, with COPPA legislation in the US restricting the activities of children under 13 online.

5.6 Comparative Benchmarking against Malta.

	Malta	London	Montreal	San Francisco
Population (metropolitan area)	0.4 million	14 million	3.6 million	4.3 million
Access to finance	Low-medium. Conservative banking industry. Malta Enterprise can provide finance for certain activities either through incentives or through equity.	Medium. Global finance centre (little games investment) and publisher HQ's	Strong. Major investment from major games publishers	Very strong. Home of venture capital, and HQ's for platforms and publishers
Games Industry	Weak (4 small developers)	Very strong publisher centre. Midsize development	Very strong development centre	Very strong publisher and developer centre
Technology Industry	Strong	Strong	Moderate-strong	Very strong (world leader)
Creative Industry	Moderate. Fewer examples. Film locations and support. Advertising,	Very strong. Games, Film, Visual FX, Advertising, Design	Strong. Games, Film, Design	Very strong. Games, Film, Visual FX
Internet Infrastructure	Strong	Strong	Strong	Very Strong
Mobile Infrastructure	3G	3G	4G late 2011	4G (Dec 2010)
Games Industry Growth	Growing, 100 man games company relocating / establishing. Rapid growth anticipated.	Falling. 9% decline in last two years	Strong growth. +33% last two years	Strong growth. Driven by social gaming
Conferences (nearby)	None	Develop Conference	Montreal International Games Summit	GDC Game Developer Conference, D.I.C.E
Universities	Strong. A few – University of Malta, St.Martins Institute. MCAST, European Inst. of Education. Art Education needs	World class universities nearby - London University Colleges, Oxford, Cambridge	Strong universities – de Quebec, McGill, Concordia	World class universities - Stanford, Berkeley and others

	Malta	London	Montreal	San Francisco
	investment.			
Climate	July 30'C Jan 12'C	July 17'C Jan 4'C	July 26'C Jan -12'C	July 17'C Jan 10'C
Language	English	English	French/English	English
Travel	Good connections in Europe	Excellent – Largest European airport hub	International airport	International airport
Cost of living	Low	Very high	Medium	High
Employee Income Tax	15-25% 35% above €20K	20% 40% above €40K	16-20% 24% above €60K	15-21% 34-37% above €35K
Company Tax Incentives	Very Strong. Lowest in Europe at 5%.	Low. R&D tax credits only	Very strong. Best of breed- 37.5% credit	Low. None
Games-specific government Support	None. Proposed in this report	Low. Modest grants, tax credits planned but later cancelled	Very strong. Commitment ongoing for more than a decade	Low. None.

5.7 Assessment of Gaps and Opportunities for Malta to pursue

5.7.1 Assessment of Gaps

Scale

Scale of population is the most obvious gap between Malta and the largest games clusters. This is obviously not going to change, and it is not realistic for Malta to compete against the big centres on their own terms. But critical mass is needed for an area to host a long term presence in a particular industry, so focused measures designed to trigger or import a substantial games cluster are going to be required. As identified in Chapter 3, these are likely to be primarily fiscal in nature.

Serving infrastructure

It is tempting to believe that Malta's existing data-centre and hosting industry is a good advantage that could translate easily into games. This may not be the case, as there is an important gap to point out first. Data-centres in Malta today service local industry and attract international business from the gambling industry. However, we have not found any obvious reason why other industries, based outside of Malta today, would especially relocate to take advantage of these data-centres, because games companies are increasingly turning to the cloud, thus benefitting from a commoditised service that can be switched on and off very rapidly without being tied to one location. Even if they did, the turn-key, lights-off style operation of data-centres means that they need few staff to keep running, and those staff are therefore not necessarily resident experts permanently adding to the island's community and economy. Another threat is the fast pace of change in this industry, and the tough level of competition, which means that companies can, and do, migrate their hosting services to other EU countries, very quickly – e.g. Netherlands is a current cost and service leader.

Enterprise Culture

Entrepreneurial cultures need entrepreneurial communities and financing. Interviews in Malta for this report identified a relatively conservative culture to risk taking, very little Angel Investment and a

financing model that is more attuned to family run businesses than, for example, venture capital backed high tech ventures with stock options and specialist employees. Malta will not turn into Silicon Valley overnight, but high tech high growth companies need the financial attitudes and infrastructure in place to enable high growth. A range of measures are envisaged in Chapter 8 that address this feature.

Location, business culture and legislative flexibility
Malta has many natural advantages. Starting with a great location, within Europe and financially within the Eurozone, it offers English as a first language, and a fabulous climate and an established culture for business. Being on an island has both disadvantages in remoteness, but in this case, offers advantages in population density and ease of access, e.g. to the airport with great connections. The key opportunities explored in this report are based around the notion that Maltese government is able to operate with speed and flexibility to enable strategic opportunities through focus, guidance, education, financial and legislative approaches.

Education and Skills Investment
Much of this report's focus on the games industry and education can be viewed as a proxy for technology skills and creative skills – which are applicable widely across many industries as the world economy moves online more, and technology transforms the way industries engage their consumers. Computers are increasingly an interactive part of everyone's lifestyle, and the gamification of life is a theme commentated on widely in the media – meaning that modes of interaction, presentation and motivation used in games can now be seen in everyday life.

This report unreservedly recommends the further investment in technology-based education in Malta, as these skills will be necessary as the basis for many industries, including games, in the future. It is clear that demand for computer science and related skillsets is increasing, even as paradoxically, in economies such as the UK, enrolment on such courses has declined. Individuals who are skilled in such areas are therefore more valuable over time.

There is also an opportunity to invest in media and artistic skills for online and games. This is again valuable across industries, and in particular, in marketing and presentation of games and other e-commerce, especially within websites. Games in many ways can be viewed as the pinnacle of modern real-time graphics, and point the way for web technologies of the future. So again, an investment in the creative skills in games does not require the growth of a games industry to lead to commercial gains.

Finally, a clear message from education for games is that team-work and multi-disciplinary skills matter. This message can be amplified from the games industry to apply to many areas of modern technological innovation – and is indeed, the theme recently highlighted by Eric Schmidt, the Chairman of Google, when talking about skills in a lecture in Edinburgh. Any educational institution able to teach team work with other disciplines, especially across both technological and artistic courses, is setting up its students for success in the modern commercial world.

A series of measures to enhance Maltese education and enable Malta to deliver the flow of graduates required for larger scale games clusters are recommended in Chapter 8.

5.7.2 Speculative opportunities

The following have been identified as speculative opportunities in our research. For a more detailed think piece on these speculative opportunities, see the Chapter 5 Appendix.

Sales and support centre: Taking example from Dublin, which hosts some support centres for games industry players such as Microsoft and Bioware105, Malta's call centre experience, online gambling expertise and multi-lingual population could allow it to build a similar proposition targeting support for European, North African and Middle Eastern games audiences. Several companies interviewed expressed a desire to monitor growth of games sectors in Arab and Africa countries, this is speculative because these markets are currently low value and may skew towards lower end platforms such as smartphones which have much lower support requirements.

Mobile Broadband and 4G: Malta's 3G mobile telephone network has the potential to be upgraded to 4G, which provides broadband speeds akin to land-based broadband, and is slowly being adopted in some countries (e.g. USA, Russia) but only slowly in Europe. Malta's early adoption of 4G could ensure that Malta becomes a testing ground for 4G and a focus of 4G application development. This is speculative because the arrival of a new mobile phone network has never triggered the rapid growth of a games development cluster. This has the potential to be a long term, and potentially expensive undertaking which could not be justified by a games cluster development policy alone.

Skill Gaming: Malta's expertise in gambling, "sealer servers" and monitoring might appear to be relevant to the borderline gaming/gambling sub-sector of skill gaming. As we have seen in Chapter 2, skill gaming is not currently a growth sector and companies face zero regulation in most European markets, so skill games companies can choose commoditised servers in the cloud. Germany has operated government certification for several years. These low barriers to entry for any location would appear to make skill gaming a low potential opportunity but we recommend that this area is monitored in the unlikely scenario that a sudden growth spurt in this decade old market occurs.

Cyber-Security: In April 2011, Sony's PlayStation Network was the victim of criminal hacking resulting in the large-scale loss of personal data. Sony has been the latest high profile victim of cybercrime, but this problem is widespread, affecting the game industry and many other industries. It is not clear how Malta could build a defensible speciality in this area, but a country such as Malta, willing to invest in legislative, enterprise incentive and international relationships could possibly create a centre of excellence.

Virtual goods and taxes: Taxation laws are changing slowly but surely to close loopholes exploited by ecommerce providers, most recently when California demanded sales tax on goods shipped outside the State, which caused Amazon to ban Californian sellers. Virtual goods sold between individuals (estimated by some to be a multi-billion dollar black/grey market) are now taxed in China but not elsewhere. Malta's legislative flexibility and skill in navigating the tricky international legislative environment around gambling may become more useful as the area of tax law surrounding virtual goods is opened up by games and other companies.

[105] See http://www.gamesindustry.biz/jobs/bioware-ireland/

Chapter 6: International Consultations with Industry

Lead Authors: Ian Shaw, William Latham.

6.1 Overview of consultation segments and their respective value-chains

6.1.1 Platform owners

There are currently three main games consoles competing for a place in the modern household: Nintendo's Wii, Sony's PlayStation 3 and Microsoft's Xbox 360. As such, these are perhaps the most visible examples of platform owners in the gaming industry. The business model is simple: design and build a proprietary console; sell 10's of millions of consoles to the public; encourage and enable publishers to release games for it; and take a royalty on every disc or download sold on the console. This business is highly competitive, and highly capital intensive, requiring billions of dollars sunk into hardware design and manufacture, before (hopefully) recouping royalties later in the cycle. There have usually been around three successful TV-based consoles in the marketplace – Sega withdrew from this market in 2001 even as Microsoft entered with the Xbox. There is a 'console cycle' of 5+ years between new releases of consoles, and that point is when the industry leader is most likely to change. Last generation, Sony was the leader with PlayStation 2, but this generation, Nintendo Wii became the best-selling console, with around 88M units sold to date, against Sony's PlayStation 3 with around 53M units sold, and Microsoft's Xbox 360 with around 56M units sold worldwide. The next generation of TV consoles is widely anticipated to debut in 2012-2013, with only the Wii U publically announced yet. It is worth noting that the current console cycle started in with Xbox 360 in 2005, and is predicted to last longer than the previous cycle by most commentators.

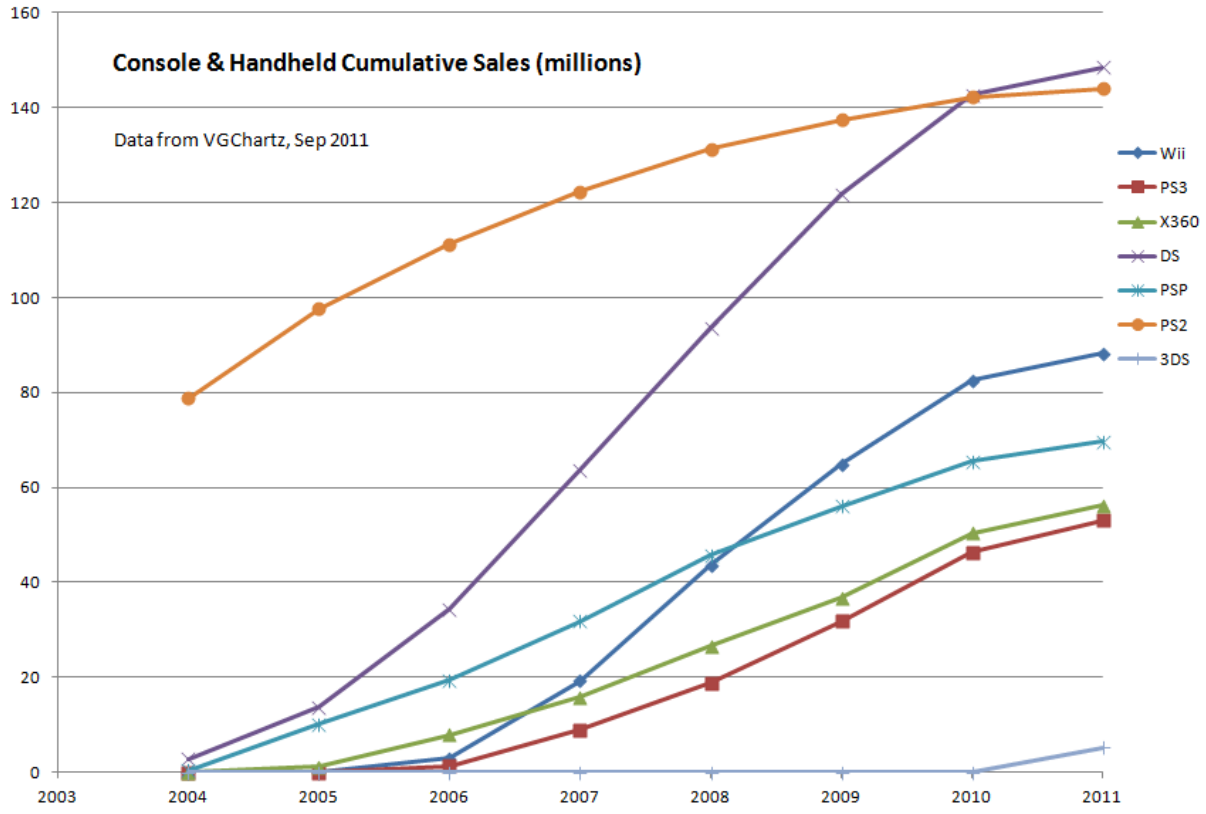


Figure 6.1 Console and Handheld Cumulative Sales

Consoles are the obvious home of AAA gaming today – the term for high production value, high budget releases, equivalent to the cinema blockbuster. But there are many other platform owners, from computers, to mobile, and also platform owners based on software standards.

The home computer is the long player in the platform competition, with the most diversity due to its open nature and widely varying capabilities. In recent years, PC gaming has held the high-ground for graphics performance (e.g. Crytek's Crysis series), has hosted the most popular MMO's (massively multiplayer online games, e.g. World of Warcraft with 12million players), and is now the medium in which social network gaming, most often seen within Facebook, is rapidly growing into a new and important sector (e.g. Zynga's Farmville and Cityville). PC is important because it is open, allowing anyone to innovate, and payment mechanisms are also in free competition, allowing rapid innovation in business models with no controls or 'gates' from platform owners. However, within the PC space, it is fair to classify Facebook itself as a platform, and one in which the payment mechanisms are provided (i.e. Facebook credits) and basic standards are already set (i.e. the social network API's allowing access to friends lists). The PC is also home to multiple successful digital download/distribution platforms, of which Valve's Steam is the most popular, with a wide range of AAA-titles to rival the mainstream consoles.

In recent years, PC's themselves have become commoditised hardware units, with much more than 50% of the consumer now being laptops, most of which are capable of playing full 3D games. The high-end enthusiastic market is still ruled by high-performance desktops, and the rapid innovation in video-card technology continues to provide more graphical horse-power than most modern console games require, which points to the potential for very high quality levels which the next wave of consoles could deliver technologically. Since PC itself is a hardware form factor, it's worth mentioning that recently, with the increasing power of Apple as a technology company (now bigger in market capitalisation than Microsoft or Google) , the PC itself is home to competition on the operating system front again – Microsoft Windows and Apple's OS X are both credible high quality operating systems, and Google has launched Android into the lower end tablet market, where it increasingly looks like a lower spec PC – e.g. the Asus Transformer is an Android Tablet with a keyboard, almost indistinguishable from a PC laptop at a distance. There are common standards that allow games and media to bridge these operating system differences, preventing incompatibility, and allowing programs greater reach in the marketplace – e.g. Adobe Flash is used for both websites and games, and in the more specific game space, 3D functionality inside the browser is created by graphics engines and plugins such as Unity or the WebGL standard, though Flash will soon compete with 3D in version 11.

The mobile platform, meaning games on phones, is a relatively new category that has been incubating for more than a decade, from the early days of Snake on old Nokia phones, to the explosive growth and viable market of smartphones, best illustrated by the launch of Angry Birds on iPhone in 2009. The mobile platform is at the forefront of the battle for the consumer's attention – as something that is with people at all times, games often get played in the gaps between other activities, and hence gameplay has evolved to fit into smaller time periods, such as Words-with-Friends (Zynga) which allows a player to take a single Scrabble-like move in a match against another friend with a mobile phone – the two are connected by the always on wireless networks. Mobile gaming today is a clear competitor to handheld platforms, represented by Sony's PlayStation Portable (PSP) and Nintendo's DS. The contrast between smartphone and handheld consoles is clear – the DS is the clear current leader in console sales, with 150 million units sold since 2004, and games in the $20-40 range – whereas smartphones will sell almost 500 million units in 2011 alone, and games cost $0-$5. Of course, not all smartphone users are game players yet, whereas a DS's only function is

games playing, but the clear pressure here is towards more mass-market titles at a lower price point, which is causing the games industry to shift how it builds them.

6.1.2 Publishers

Publishing video games sounds like it should work similarly to, say, book publishing. The comparison is mostly valid – the book world starts with sourcing content; negotiating rights; funding writing; editing and packaging and proof reading it; then duplicating (printing books); distributing (shipping to shops) and marketing and selling. Indeed, video games publishers typically do operate all those steps in the value chain: IP-licensing; signing contracts with developers; funding production; directing development to reach target markets; checking the quality (QA); packaging for console/PC/phone platforms; duplicating and distributing – either in physical disc/cartridge form or electronic distribution; marketing – via media channels; and selling – either in physical shops or on digital distribution e-commerce channels.

So publishing is perhaps used as a label for most of the value chain, and the types of expertise are diverse across a range of standard professional skills and niche-industry specialties. But some activities are more important than others, and those are the things that make publishers one of the most powerful players in the games industry value chain: IP-control, financing and production.

IP-ownership is key for games, and is the foundation for most publishers. Intellectual Properties (IP) are names of games series which can be repeated through sequels, and, in games even more so than other media types, it is these franchises which generate the majority of the profits, and sit at the top of the charts, with the highest development budgets and production quality. Big franchises are typically based on a fictional universe (e.g. Star Wars, Lord of the Rings), or fictional characters (e.g. Harry Potter, James Bond), on popular video game characters (e.g. Mario, Sonic, Tomb Raider, Angry Birds), video gameplay styles (e.g. Call of Duty as a first-person-shooters, Need-for-Speed as driving game brand), or on sporting events and leagues (e.g. FIFA, Madden), or even on other elements in the game (e.g. Porsche or Ferrari cars). Sometimes publishers have been able to leverage common branding across different titles – e.g. Zynga's Farmville, Cityville. Franchises matter in games because of the high number of titles in the market place – they help consumers discover what they will like – and because they give the publisher confidence and predictability in investing high production budgets. While publishers benefit most from owning their IP, many franchises are actually IP-licenses from Hollywood or Sports names, so in that case the publisher typically owns a long-term exclusive contract with the licensors.

Alongside IP control, publishers typically organise finance for production. A high end console game might take 2 to 5 years to create, with budgets in the $20M to $50M+ range, so expert production management is needed to control the risk, which is that in the worst case, an expensive and late project may fail completely in the marketplace. External investing is often keen to see the returns of hit titles, which can be a large multiplier on the original investment, but lacks the specialist skills needed to navigate these production cycles, so from that perspective, publishing is a risk-management vehicle for investing. Meanwhile, different gameplay genres have very different production profiles too. Casual games and social games are recent hit genres with shorter (6-12 month) development cycles and revenue from advertising and microtransactions. MMO's are massively multiplayer online games, which have long production cycles (2-4 years) followed by ongoing development while players pay a subscription in general for the service. It is worth highlighting that Xbox Live Arcade (XBLA) and PlayStation Network (PSN) games are console based online distributed titles. They are typically smaller games, built at lower budgets of $400K to $800K over 9 months to 1.5 years, with smaller teams size of 8 to 20. All these models can be highly profitable, for a successful title, but require different cash flow and monetisation strategies. It is

worth noting that a large number of games do not make a profit: according to EEDAR research in 2008, 20% of released games are profitable. Other industry estimates suggest that 1 in 3 games are cancelled in early stage of development, so games can be considered a very hit driven industry.

Production teams are the final piece of publisher power. Understanding markets, market timing, project management and creative direction, a production team is able to work with developers to get the best out of game projects. Typically, an IP-deal is done first, then developers may be selected from studio teams internally owned by the publisher, or from external, independent developers. Multiple different platforms will require different approaches, and the best release strategy is often to coordinate all these different efforts to a common release timing, maximising the effectiveness of marketing dollars.

6.1.3 Services

Services are a company sector in themselves, but are also often a part of the publishers' value chain operations. These are typically individual, separable pieces of operations, and are offered as outsourcing services by large providers to some of the smaller publishers, or to developers directly, and even as scalable services to the larger publishers at peak times of demand.

QA, quality assurance, is a highly scalable service, as large test teams (80+) are needed at the end of console development cycles, whereas typically only 1-2 fulltime QA leads are used from the early days of development. QA is also a very seasonal industry, with busy summer months needed to get titles ready for the busy Christmas/Thanksgiving period. This leads to high numbers of contractors being used, and QA companies are typically expert at rapid ramp up and down of staff, with a database infrastructure to capture and manage bugs which must be fixed to complete a project.

Localisation is also something done at the backend of production. Modern games have dialogue in text form, and voice-acting, so scripts, actors and recording sessions must be managed in workflow that happens very late as a game is finished. Different scales of titles target different regional territories, so it is common to localise just to the top markets – EFIGS (English, French, Italian, German, Spanish) or more widely to up to 20 languages, including several with other alphabets and font requirements, such as Korean, Japanese, Chinese and Thai. Titles aimed at different aged audiences, or requiring a cinematic feel may use a mix of voice-dubbing and subtitles depending on what is commercially viable. Localisation can add 30-50% to the sales of a title, but can also cost up to $10K to $25K for each localised region.

Other services are more like standard business operations – e.g. IT, finance, legal, marketing, PR, and e-commerce transactions. Each might have a special approach that makes them better at dealing with games. These services might be staffed with internal publisher employees, or contracted in to smaller publishers or developers directly. In fact, developers often call themselves publishers when they manage these outsourced services sufficiently to extend their reach all the way to the consumer relationship.

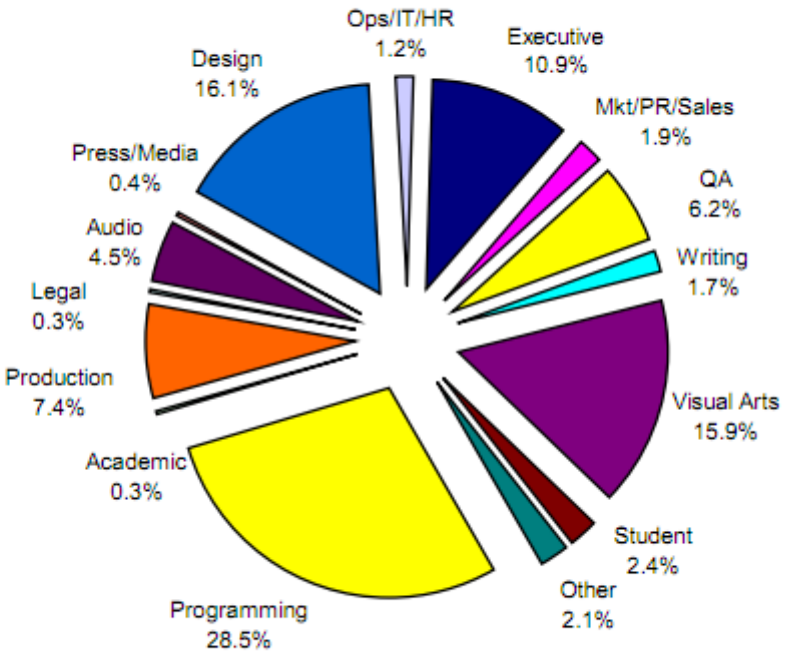
Middleware is the final service type to mention. Software engineering speciality modules for games are available off-the-shelf or as integrated services for developers. This market is extremely specialist, and very challenging to get to the volume needed for successful software monetisation. Successful middleware companies are therefore often spin-offs of great games studios (e.g. Epic's Unreal, Criterion's Renderware), but start-ups do evolve to success (e.g. Unity, Natural Motion, Havok).

6.1.4 Developers

Developers are the originators of games. They are often known as studios in reference to their film industry equivalents, though in practise they are very different environments – film being based around physical props and cameras makes for a much more visual environment to the more office-like, computer and desk based work that goes on at a typical game studio. However, that should not be taken to understate the creativity and buzz around a successful developer – these groups of people represent creative talent at their best, working with the very latest digital tools to deliver exciting interactive experiences.

Diversity is key – 'herding cats' is a common phrase when discussing management technique for developers. Games incorporate every media type, so much so that multimedia is an understatement for what they deliver. In this environment, the media crafts of visual arts, audio, programming and design are managed by production teams, often with large QA groups as part of the process. The table below shows the breakdown of skills (by headcount) in the official IGDA survey of developer demographics. The survey is based on voluntary response, and is western centric, but shows the range of skills well. It does under-represent the total number of artists, who are probably now the largest sector by overall industry worldwide headcount, though this is caused by larger numbers of artists in outsourcing centres, such as India, China, where IGDA lacks representation.

Game Developer Demographics: An Exploration of Workforce Diversity



igda.org/diversity/

Figure 3: Responses by Job Title

6.1.5 Physical Distributors & Retail

The games industry has grown from the 80's until today based strongly on physical media, which mass duplicated, packaged and shipped to retailers (traditional and specialist shops). This media has changed from tapes to cartridges (still used today by Nintendo DS), to optical media (DVD, Blu-Ray and proprietary formats). The distribution industry for games is often a point of aggregation, with individual distributors in a territory carrying product lines from multiple publishers. Larger publishers have sometimes chosen to distribute for themselves, e.g. Electronic Arts has built probably the strongest international physical distribution network, and frequently co-distributes even for other publishers in several territories.

In retail there are several important specialist players (e.g. Game in the UK, Gamestop in USA), and publisher marketing budgets reach all the way through the value chain to even purchase shop-window slots and aisle-end display units, which are valuable promotion points for new products. Hence the stronger publishers who can leverage their scale all the way through to distribution to the stores gain a competitive advantage even there.

Physical goods retail is not just shop based today – Amazon.com is a massive player, and the software, which is light to post, is an ideal item for online purchase with postal delivery. It is also highly prone to discounting, when a product fails to sell in its first couple of weeks, leaving the publisher with overstocks.
The most controversial element for retail's place in the value chain is second-hand-sales. Major specialist games stores do trade-ins and sell used-games. With AAA games holding perhaps 10-20 hours of experience, consumers are taking advantage of trade-ins to get perhaps 70% of their money back after a week's ownership. This business is netting the retails from 20% upwards of their revenue, but 40%+ of profits, while the studios and publishers don't get a cut. As a result, online features (which can be tracked separately from the boxed product) are increasingly being restricted to the first user of a game (e.g. Ubisoft's Uplay, EA's online-pass).

Meanwhile, consoles still depend on high-street stores to sell their hardware, and publishers still depend on stores to sell games, but the friction over second-hand cash-flow is increasing, and simultaneously the publishers are looking to online distribution as a growing area.

6.1.6 Online Distributors

Eminent technologist Ray Kurzweil has studied the way people perceive technological change and proposed the Law of Accelerating Returns. It is known that we over-estimate change in the short term, as we desire things to happen, but then get frustrated with the issues and blockers en route. However, we typically under-estimate change in the long term, and this error factor is even greater. This apparent paradox is because technology changes often occur exponentially, building up more slowly than we anticipate, but eventually taking off to become more significant than we ever imagined. The trends, identified by analysts and press, are very often correct, but as with all investments, timing is everything.

In the games industry, the trend from retail towards online distribution is an issue that shows all properties described above. Initial hype has turned to frustration, and several high profile online efforts in the past have failed to turn a profit. However, the hockey-stick online sales growth graph is beginning, and headline examples include Apple's iPhone AppStore, with 15billion downloads in 3 years, and Facebook games, e.g. Cityville by Zynga, with 148million players across 166 countries in 2011.

There are still several methods of online distribution – Amazon alone covers several, starting with e-commerce and physical fulfilment, and branching out through second hand marketplace, digital download (e.g. MP3's), and an App-Store (games etc. for Android phones), as well as subscriptions (e.g. magazines for Kindle). Microsoft and Sony both segment their TV-console games into higher price point retail discs, which are then available as games-on-demand; then add in DLC (downloadable content) and, lower down the price range, do smaller titles (Xbox-Live-Arcade and PlayStation Network). Nintendo has a more limited range, but has majored in retro-gaming, e.g. re-releasing older titles such as Mario-Kart64 as cheaper downloads for the Wii. What is notable about Nintendo is that they still focus 100% on games – all the other players above offer other media types as an integrated part of their digital distribution – including film, TV, music, radio, advertising and meta-content, such as user ratings.

In the PC space, the download ecosystem is even more diverse. As an open platform, browser based Flash games can be downloaded and played in seconds, often funded by advertising alone. Then the try-before-you-buy model is common, with games and apps available often direct from a developer website – a publisher-less model. However, major online retail is still dominated by published titles, developed for disc, and downloaded in 10's of minutes or hours to a consumer PC. The one channel player with largest share here is Valve, with the Steam distribution network – this is interesting as Valve are a high tech independent (of platforms/publishers) developer, and yet they've built the best PC distribution network with organic growth over the last decade since seeding it with their hit title Half-Life2.

In the mobile space, online distribution was held back for many years, as the mobile operators controlled a closed-wall ecosystem with a deck of very few discoverable titles. It took Apple with the iPhone to create a more open system, which though still run and regulated by Apple (who take a 30% cut of revenues), created a single point of trust and purchase for a consumer's credit card details. The success of the Apple app-store is now enshrined in history, and Google's Android platform is attracting multiple online distribution partners, from Amazon to Sony (with official PlayStation 1 titles). These customer relationships are on the forefront of competition, with the platform holders themselves often winning the battle to control payment mechanisms, which may involve stored credit details and/or stored value credits.

There is a new wave of innovation in online distribution: often called cloud-gaming, it may be better described as online-streaming. Companies such as OnLive and Gaikai have built technology to run games in server farms (typically located near high population centres), and transmit the images rendered back to the consumer as if they were cable-TV images. This technology is controversial in two ways: firstly, it introduces a delay in gameplay due to internet latency, and secondly, it is widely thought to be un-economical due to high costs of servers and bandwidth. Investors hope the latter problem will decrease naturally over time, getting cheaper as technologies do, but the latency problem is more fundamental – signals can never travel faster than the speed of light. A console connected directly to a TV, and playing a driving game at 60fps, might experience a delay of 50-80ms between a player's actions and seeing them on the screen. However, delays of 150ms are common in streamed gaming, as the information has to travel from the home to the data-centre and back. Early trials suggest this is acceptable for some game genres and customers. Whether cloud-gaming succeeds or not, there is a clear trend for the games industry to place more demand on the internet, in bandwidth and latency. This an investment rich area with Onlive raising $100M in investment (from HTC and British Telecom) and Gaikai raising $45M+ in investment (from Intel, Qualcomm, NEA).

6.1.7 Internet Infrastructure & 4G Mobile

Internet infrastructure has already been discussed in the context of Malta in chapter 4 – this is an area which already has representatives of all major sub-sectors. ISP's (internet service providers) are the companies that provide wired internet access, and increasingly branch out into the mobile space too (e.g. as in the case of Go & Melita in Malta). Such wired internet, at high speeds, and with good connection to the internet backbone, is the critical foundation for quality – delivering bandwidth (speed), latency (responsiveness) and reliability.

Mobile providers are actually ISP's too though, with 3G connectivity allowing mobile phones and wireless dongles on PCs to access the internet. The mobile infrastructure investment space is dominated today with 4G network roll-out – countries as diverse as the USA and Russia have already got 4G networks operational in major cities, and equipment that uses this can often degrade to 3G access where a signal is not available. 4G is a revolution in internet access – countries and companies are investing in it according to local conditions, but it offers the promise of shortcutting the logistical problems of laying cables, while delivering the internet at greater speeds than a slow wired broadband connection. That makes it a great solution from Africa to rural England, but one which is typically gated by the speed of government legislation or wireless spectrum auction costs. Commentators suggest that Europe is falling behind in 4G after its early lead in 3G and SMS – Germany has only just auctioned off 4G spectrum, with the UK due to do so next year. There is widely expected to be an explosion of creative applications for such high performance wireless broadband, and since games have been the major application in the mobile smartphone space so far, they can also be expected to lead the way in 4G.

6.1.8 Hosting

The final part of the internet service industry required by games is server hosting. Large data-centres are typically clean, modern warehouse buildings, with excellent power supply, air-cooling and security. These rooms are filled with racks of computers and storage, all connected together with high speed networking to the outside world. These facilities, once set up, may refresh hardware every 6 months to 3 years, depending on which market they share, and the technology of virtualisation means that each computer in the centre may be shared across several different client applications for economies of scale.

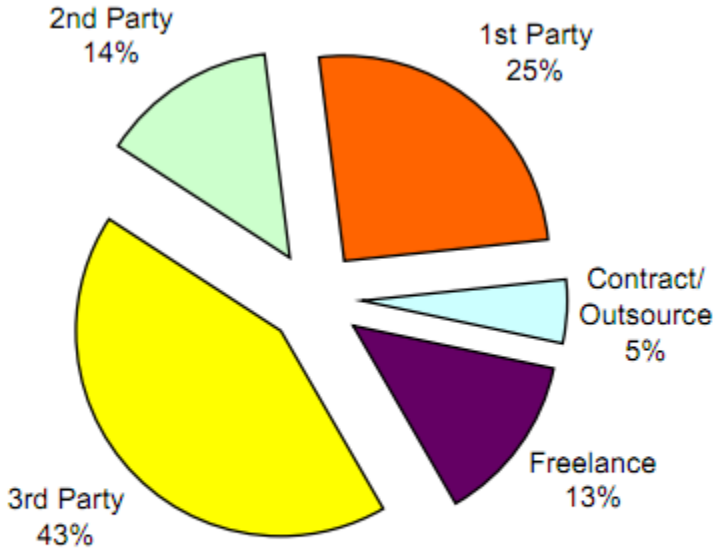
Maintaining such infrastructure is beyond the core skillset of most modern games companies, and this area has become a highly competitive service industry, competing on price, performance, security, and scalability (the ability to ramp up performance if demand surges).

Data centre needs are mostly similar for games and web / e-commerce industries, although games can be more intensive in their response times, and cloud-gaming (see above) has special needs concerning the graphics cards which are used. Data centres are common across Europe, with Netherlands known as a good site for cost and Europe-wide access. Malta has a healthy hosting industry, especially in the gambling and iGaming sectors. The strategic outlook for data centres continues to see cut-throat competition, as the area is commoditised and consolidated, with few personnel required to run a large computing operation. This area can be important with regard to legislation though, as the legal territory within which a server is run can be highly significant, e.g. in the regulation of online gambling. Our investigations and interviews in Malta have not shown any obvious cross-over of man power and specific skills associated with the gambling industry across to the video gaming industry however. Though there may be opportunities around Skills based gaming as a niche area and associated specific legislation to host games in this area in Malta.

6.1.9 Vertically Integrated Companies

Any modern games business is part of the fast moving, high technology, trend-driven media industry. As such, these businesses are constantly adapting, taking on skills and roles across the value chain. Above, the roles of publishers and developers were discussed as if they were distinct positions in the value chain. The reality is that these borders between different areas are fluid, and that many large games industry players are vertically integrated – i.e. they have deliberately built their company to operate in many or even most of these areas.

This is easily seen by looking at developers – they are often not just developers. The IGDA (International Game Developers Association) demographic survey shows that 39% of developers are actually owned by platform owners (1st party) and publishers (2nd party). That leaves 43% of developer headcount employed by traditional indie devs (i.e. owned independently of publishers, aka 3rd party) developers, and also a very significant 18% sector of contractors, outsourcers and freelancers.



igda.org/diversity/

Game Developer Demographics: An Exploration of Workforce Diversity

Flipping this picture around to look at publishers – they are often actually composed, by headcount, of 60-80% development staff, as all the major publishers all own their own studios (aka 2nd party development).

Finally, considering the major console platform owners, all three of them - Sony, Microsoft, and Nintendo – are also significant publishers in their own right, despite restricting their output to their own consoles. This integration is a significant example of 'coopetition', where the platform owners are cooperating to enable publishers on their platform, but competing by publishing their own titles, many of which are the best-selling titles themselves (e.g. Microsoft's Halo, Nintendo's Mario, Sony's Uncharted).

The strategic purpose of owning in house development is to control the positioning of the platform, and drive unique titles that cannot be experienced elsewhere, as a draw to consumers. This comes

with a large management overhead in running studios, which more recent platform owners, such as Facebook and Apple have so far not replicated – perhaps because those platforms are not exclusively game focused, but each have successfully attracted major specialist publishers to their platforms – e.g. Zynga on Facebook, and Gameloft/ngmoco/Rovio on Apple/iOS.

6.2 Review of consultation findings

6.2.1 Research Findings

Company strategy can be one of the more confidential areas beyond the immediate horizon of announced products. However, most are willing to talk about trends in their markets and which strategies would be under consideration. The below generalises from conversations with industry to talk about the major areas of growth and development experienced at the moment, without giving away specific details of individual company tactics. The following trends were revealed in industry interviews including eighteen top companies, which between them control much more than 50% of the total industry revenues, representing all sectors of the value chain, and covering games in all major genres. See 6.3 for a list of company names.

Malta is not well known

Only a couple of interviewees knew about the role Malta has played in regulating gambling, and for all others it was seen primarily as a holiday destination. All were much more willing to work with Malta once they understood it as a Eurozone and EU country.

Challenging Times for the Games Industry

Most of our interviewers are working in the highly successful companies in the games industry, but all of them agreed that the industry as a whole is encountering a lot of change and a lot of challenge at the moment. This is an opportunity to the those who grab it though, and there are clear indicators that gaming is growing 10-20% per annum as a worldwide phenomenon – it's just that certain sectors, in particular AAA games on consoles, are shrinking, or becoming more competitive.

Business Model is Evolving Right Now

All of the companies we spoke to were acutely aware of the new business models, especially free-to-play, micro-transactions, advertising and mobile phone games. Some are limited in their ability to make experiments in these fields because their publisher or platform owner restricts business conditions – e.g. free to play isn't yet available on any consoles, but free-demos with pay-to-unlock is.

Most businesses, offered a chance to comment on what governments could do for them, actually declined. There are several reasons they are reluctant to engage: firstly, in that business moves at a rapid pace but that government is perceived not to; secondly that they are not clear which legal or incentives details their company actually needs – even very senior personnel were more focused on their operational excellence rather than on asking for external help.

Rise of Online and Digital Distribution

Games Retail in shops is very much the past, and the necessary present for those dealing in boxed product – discs, consoles and cartridges. However the controversy of second-hand sales, where retail makes money several times on the same game, but doesn't give publishers or developers any more royalties, is causing a lot of tension. So everyone agrees that digital distribution is the way forward, and that bandwidth needs to continue to improve all the way to the customer's homes. Some go further in seeing browser based gaming as the natural place for games to become more instant and more accessible – killing friction (which is anything that comes between a player and the experience).

Infrastructure is taken for granted
The internet, and IT, and computers and tools, are all very necessary to operate in the games industry. But they are completely assumed, so for Malta, having a great internet offering is a bare minimum to compete, not an advantage. Most were actually sceptical that an island could have a great offering here, so PR is needed too.

Tax Credits mean nothing on their Own
Tax credits are a way of optimising business costs, which everyone acknowledges as important. But several people pointed out that, while tax credits would help them choose one place over another, they were not sufficient in themselves, and over-riding issues such as talent availability would be much more important first.

Some Games Markets may be Over Stretched
We heard several comments about markets being stretched: Social networked gaming is attracting too many cloned products. iPhone games are entering a market with too many offerings so being heard above the noise is impossible. Montreal is offering great tax breaks, but running out of employees to hire. Publishers and developers are sometimes doing deals where both sides know they are stretched too thinly for risk. Publisher expectations of high quality from developers on low budgets are unrealistic. Obviously, many of the above concerns might relate to individual issues, but we heard each theme expressed at least twice.

Starting a New Games Business is Tough
If the goal was to work with a Maltese business, the vast majority of respondents would look for an existing partner in Malta, rather than consider seeding one themselves. And most are also looking to partner with a proven company, so for a new company, getting their first project funded and completed is seen as a seriously tough challenge.

6.2.2 Perception of Malta's value-proposition

Malta is not currently 'on the radar' for the games industry companies we interviewed. In answering their questions, it becomes clearer what their key concerns are.

First assumptions are often that it is an island-holiday destination. That's certainly a positive image of the place, and often leads to friendly jokes about how keen people would be to lead their own company's efforts there. It does mean there is a positive image about the place, but this isn't necessarily associated with business.

Second wave of questions is typically about the skill base on the island – how can such a small place maintain a large enough talent base for the specialist skills of games companies?.

Third wave of questions tends to be around which companies are there already. At this point, the legislation around iGaming and gambling is easy to point to, and there are also a few examples of individuals in games moving for motivations ranging from love-of-the-island to taxation. There are not, however, enough clear examples of what the games industry does on the island, nor enough of a clear focus to 'sell' what Malta is best at. There is now some growing awareness with the TRC Family Entertainment press announcement and associated coverage in leading online games new website including Gamasutra, Develop-Online, GamesIndustry.biz and others which is improving awareness.

6.2.3 Island Risks

The internet grew out of US Defence investments to create computing networks that could survive nuclear attack. As such, the internet is self-healing. This means that when a major node in the network goes down, routing uses the remaining connectivity to re-route and adapt. If that node is, say, in central Europe, it will have a densely connected network to adapt within, and service will not be disrupted for long. If however, the node that goes down is the main internet cable to an island, there simply aren't as many options to reroute traffic, and the network is therefore more vulnerable. Multiple interviewees expressed a prejudice that an island is not a good place for an internet based business, since the assumption would be that it depended on single-point internet connectivity.

Our research shows that the above concern has already been addressed in Malta – data-centres already existing in Malta use multiple ISP's and multiple cables to route to Europe via Sicily and Italy, with standby technology on microwave transmitters too. Meanwhile, the trend in internet outages today is less caused by physical damage (though electricity outages are an issue both in Malta and around the world) and more about security and hacking attacks. There is a conclusion here though, in that an island has an implicit PR challenge to answer prejudice reliability and risk issues.

6.2.3 Which locations are current operations based in? What key resources are used in those locations?

Platforms

Platform holders typically run a worldwide business. Some run more centrally from a single HQ which runs the business from R&D to commercialisation – e.g. Microsoft, Facebook, Apple - whereas another common structure is to have global regional HQ's for US/Canada, Europe, Asia – e.g. Sony. In practise, it's not quite that simple, with even the single focused players also having account management, sales and marketing in global territories for both development and consumer markets.
The scale of operation is important – Sony in particular grew its structures to cope with demand during the PlayStation 2 era when it was the dominant player, and restructured since to adapt to new market conditions, with the Presidency of Sony Computer Entertainment shifting from Japan to London to San Francisco in the last few years.

San Francisco is host to the most platform companies, including HQ's for Apple and Facebook. Seattle hosts Nintendo and Microsoft, while Sony and Nintendo have their worldwide headquarters, and hardware R&D labs in Japan. Hardware and technology companies are mainly in USA – e.g. Intel, Qualcomm, NVIDIA – with some important players in Europe (ARM, Imagination/PowerVR in UK), and manufacturing outsourcing for both chips and hardware systems typically in China and Asia – e.g. Foxconn, Flextronics and TSMC.

Platform owners also typically have large publishing and development studios (see below). They also need account management staff to manage relationships at the borders between these businesses – e.g. developer relations, aka dev-rels, visit successful developers to educate them in how to best direct content on the platform, which optimises profit for the developer, and royalties for the platform owner and publishers.

Publishers

Major publishers are based in global clusters, typically in Los Angeles, San Francisco, Seattle; in Europe in London and Paris; in Japan in Tokyo and Kyoto. That accounts for most of the top players: Activision / Blizzard (LA), Electronic Arts (SF), Ubisoft (Paris), Nintendo (Kyoto/Seattle), Sony (Tokyo/SF), Microsoft (Seattle), THQ (LA), Square/Enix/Eidos (Tokyo/London), Konami (Tokyo). New

and growing players are emerging at scale in new genres or new territories: Zynga (LA), Tencent (Shenzen / China), NCSoft (Seoul/Korea, Austin/Texas). There are also physical distribution hubs for disc and cartridge based products – these are typically located at large transport hubs, e.g. near Rotterdam for Europe.

There are many small to medium players that call themselves publishers though – far too many to list. Typically, these are vertically integrated developer-publishers who handle their whole path to market and consumer relationship. There is much diversity in this group: successful examples include Bigpoint (casual games, Hamburg and Malta), Jagex (MMOGs- Cambridge, UK), PopCap (casual – Seattle), Playfish (London), Valve (shooters, and steam distribution platform – Seattle).

Asian growth is a startling phenomenon here – even as Japan has gradually seen its influence, in console games, erode slightly, China and Korea have seen companies growing rapidly with new business models that fit their consumers well. Such companies when growing in the west are typically partnering with well-established local mid-sized publishers, and often with famous industry names to establish credibility. E.g. NCSoft expanding from Korea due to the success of its online titles, and formed studios in Austin/Texas and Brighton/UK (now closed) with traditional games industry veteran Richard Garriott. As with other acquisitive growth, these deals rely on a local industry succeeding first, then strengthen financials with a global partnership.

Publishers resources are a wide cross section of business skills, from business development, sales, marketing, PR, financing, legal, and QA, to more specific games skills such as project management and production, technical, artistic and design direction.

Developers

There are too many developers to enumerate, even with research, since many start as one-to-five man outfits under the radar, before either getting funding to grow, or silently failing when seed money runs out. There is a self-submission mapping website, David Perry's Industry Map, which charts developers, and shows that there is essentially a high number of companies in places in USA and Northern Europe which have high populations. There are fewer developers than might be expected in Southern and Mediterranean climates, and Eastern Europe.

The important clusters though, are probably visible only when filtering by revenue and big hits. It then becomes clear that large successful developers are often located in clusters in towns and cities – in North America, the biggest are Seattle, Montreal, Vancouver, San Francisco, LA, and Austin. In Europe, London, Paris, Guildford, Liverpool/Manchester, UK-Midlands, and Cambridge all have multiple successful top charting developers. There are then emerging players whose success may seed a region – e.g. Hamburg and Frankfurt, and declining players whose past success may yet lead to industry survival through hard times – e.g. Dundee and Lyon. The most recent trend is for successful developers to also have a lower cost satellite studio in Eastern Europe – e.g. Epic in Poland and Crytek in Budapest/Kiev.

Services organisations tend to be lower margin, ongoing businesses, so are typically based near to development hubs, but perhaps in slightly lower cost centres. E.g. Havok is in Dublin/Ireland; Autodesk is in Toronto, Montreal and sales outside of London; Unity is in London and Copenhagen; localisation groups are in Brighton, Spain and Ireland.

Developers are typically staffed with large numbers of each games craft: programming, artwork, animation, audio and music, and game design, with production, project management and business executive oversight.

Education/Training
There are many good universities throughout Europe and the USA, which attract talent both locally and globally for the top institutions. Asian universities tend to cater for local markets more, and often import experienced western talent for teaching. Universities can be divided into traditional academic institutions, and games-specific courses. Graduates from both types of course enjoy success in the games industry, but with increasing competition to build games, a games specific Master's Degree on top of a high quality academic Bachelor's Degree can be the best preparation for employment.

For a representative cross section of educational institutions, see chapter 5 of this report.

Educational institutions need a mix of both academic teaching staff and good quality students. Both are pulled from reasonably local talent pools, and specialist talent is pulled in from academia and industry on a part-time basis to fill gaps.

6.2.4 Investment plans and development interests.

The factors which are concerning companies around growth today are typically already very clear in their minds. Gaming as an industry is a place where survival is not taken for granted, and bold, clear strategy is often what differentiates the successful players. Investors and financiers also typically have very clear ideas as to what a games strategy needs to be, down to which genre and market are being addressed, since the cash flow and risk profile vary dramatically depending on these choices.
Some of the growth and innovation strategies we noted in discussions with industry are:

- **New genres**: social and casual gaming are modifying the ways games work, and motion-based gaming (Wii, Kinect, Move) has unlocked new genres too. As these genres prove popular, this can unlock a popular trend in the market.
- **New payment methods:** subscriptions, advertising and micro-transactions (paying incrementally for game features) are growing relative to the traditional disc-box-retail model.
- **New markets:** new territories (China, Korea), new demographics (e.g. women/30-40), and new subject matter (e.g. dancing/fitness games) all present opportunities which are reported on by analysts, and companies chase with strategic positioning. Sometimes this leads to poor games though, so high quality design is still key.
- **Try everything:** with so much change and uncertainty, large companies are trying experimental, low cost prototypes and market trials across different areas. Fast failure, learning and adaptation are key values here.
- **Focused bets:** the reverse of try everything, smaller companies are thinking hard about trends, and placing single, razor sharp focused bets, in an all-or-nothing play using their limited resources.
- **Organic growth**: business based on low costs, and early revenue, taking care with cash flow, build up only at the speed the market can stand. This is less risky, but growth can be slow relative to venture funded organisations.
- **First or Fastest to market**: there are always new ideas, and being first to market, then continuing at speed to lead rivals, has always been important in the internet space. More recently, this is the strategy followed by Zynga with Facebook gaming.
- **Production sequels**: there are plenty of games which are iterating, year on year, based on previous successful titles from the same publisher, and/or competing with a direct rival. Sequels and direct competition are common in the biggest marketplaces – e.g. Call of Duty

vs. Battlefield franchises are similar titles, one of which is likely to be Christmas number 1 this year.

- **Invest in the winners**: really large platform owners and publishers can afford to cherry pick the successful mid-scale companies, often paying a premium for acquisitions, especially in strategically important areas. E.g. Electronic Arts recently paid around $750M for the casual games developer PopCap.
- **Follow the Incentives**: e.g. Montreal as a location attracts companies that need to expand skilled developer headcounts, but who otherwise don't have a strong preference for location.
- **Cost Management**: the global financial situation means that many large companies, especially in the console space, are struggling with cost management and low margins, to maintain their market share and revenues. These companies are sometimes consolidating operations and closing down unprofitable projects or locations.
- **Opportunistic deals**: some publishers are genuinely looking for the next projects to invest in, but are limited by the talent and opportunities that they find. There is definitely money sitting on the side-lines, waiting for the right pitch with good talent behind it.
- **Battle for Talent:** talent is the key behind most great hits still. Even a bad idea executed well by great talent is likely to outperform a great idea badly executed. Companies tend to work opportunistically with great talent by making publisher-developer deals when the right project is available.

6.2.4 How global companies make location decisions

From a territory perspective, the main split is between territories chosen strategically because they represent a significant consumer market, versus territories chosen for their supply of talent or incentives. We will examine each strategy in turn.

Strategy: Follow the Consumer

There are plenty of examples, in any industry of companies relocating their sales offices to be nearer to their customers. The same is true in the games industry, especially for publishers who often have sales people working face to face with large regional retailers. A typical structure for a large publisher (e.g. Electronic Arts, Activision, Microsoft ... in fact most of them) is to have a global headquarters, with regional headquarters for US, Europe and Asia separately. Each regional headquarters would host country managers for main territories, and the smaller territories might be grouped together depending on the scale of the operation – e.g. Nordics. The major territory groups in Europe are defined by proximity to each other, language spoken, and market similarity. E.g. Germany is often treated separately, as it is surprisingly heavily based in PC gaming, with consoles under-represented relative to other major European countries.

Malta is not a candidate for this sort of relocation, since it does not represent a significant sized marketplace in itself. We explored in industry interviews how Malta would be grouped, and the reality today is that it is seen as a subset of the Italian market due to physical supply chain. There is some speculation that if it were to become a strategic gateway to Africa or the Middle East, it could become a centre of excellence for those trade relationships. However, neither Africa nor the Middle East are yet significant markets in themselves and indications are that growth in these territories will take 5 to 10 years.

The question whether Malta could become the 'Dublin of Southern Europe' was raised. Dublin has grown as a service and support centre with a number of leading game companies, including Bioware and Microsoft. The industry response was that Malta would need to offer similar incentives as Dublin – Ireland has a famously low corporation tax. Also, latency issues for online gaming may means that

Malta's locality gives it an advantage into North Africa and the Middle East, and games can be latency critical applications. Currently, large companies see Malta as a sales territory, often grouped under Southern Europe, or Italy. To become a regional centre in itself, Maltese organisations should seek to build trust and direct report lines into European headquarters – often London, so language should be an advantage here. For example, with Microsoft and Sony organisations, Dublin is a service centre and part of SCEE (Sony Computer Entertainment Europe) whereas Dublin reports to Microsoft Head Office directly, not as a country sub report.

Cultural fit is particularly important in emerging markets – it is no coincidence that Korea's growing market, based around a unique culture of internet cafes and tournament gaming, is served mostly by local developers (with the one mighty exception of StarCraft – a uniquely brilliant real time strategy game from Blizzard in LA, which became the basis of professional tournaments over a decade). European markets are also strangely fragmented in some ways. The console market in Germany is much smaller than might be expected, but the territory purchases a larger share of PC computer games, especially in the strategy genres, and this can only be explained and understood in the context of the local culture. Hence, some large consumer territories like Germany and Korea, demand local company location to successfully address the marketplace.

Strategy: Capture the Talent base

A large, highly skilled and diversely talented base of employees is vital to lead in the competitive, technologically and creatively driven games markets. In most cases, the games industry has grown organically in such areas, with games companies maturing alongside healthy creative and tech industries in centres such as London, San Francisco, Seattle, and Tokyo. In each of these cases, the size of the city was also enough to attract specialist immigration – the brain drain from smaller areas. London in particular has benefitted over time from free talent migration across the whole of the European Union – as an aspirational city for employees to live in, companies find it easy to attract top talent there, though with high costs they have to pay for it. Likewise, the USA has done well in hosting hubs which have grown organically overtime, and the talent has often migrated away from medium sized hubs to the larger ones as companies and industry trends have consolidated – e.g. Las Vegas once hosted the hit developer Westwood Studios who built Command and Conquer, but most of those staff moved gradually across to Los Angeles, a bigger and more permanent centre of games development today. The above examples are emergent behaviour based on scale of cities, and employee preferences, rather than government managed growth. Hence we conclude that facilitating or encouraging this style of natural organic growth is both beyond Malta's scale as an island population, and difficult to encourage externally to the companies operating in those areas.

Medium sized clusters are perhaps more interesting here – e.g. Austin in Texas became a well-known hub for online gaming, with Origin Systems building Ultima Online, the first well known graphical MMO-RPG (massively multiplayer online role playing game) here in the mid-90's. This genre was both innovative and successful, so much so that a hub of developers in Austin was created through experienced employees and spin-offs, with the area known for MMO's to this day, though it has recently experienced some downturn in staffing levels due to commercial conditions.

Strategy: Relocate to Grow

It is very common for successful games companies to experience hyper-growth in corporate terms. For small studios, an initial hit built by a modest team can provide the cash, the foundation, and the consumer demand for sequels, which then must be built with some urgency to keep the momentum going. The initial location of the studio might be coincidental, based on where the founders live, or even a spin-off already in a successful games industry hub location. New locations are typically chosen, once the business is successful, not by costs alone (since successful companies have

relatively high profit margins), but by factors dominated by accessibility to talent – transport links for commuting and proximity to cities. Even then, most moves are limited to around 10 miles.

A couple of selected games studio moves illustrate the situation well – Traveller's Tales, now part of Warner Brothers, is famous for its Lego Star Wars and other movie themed titles. As a studio, it was founded in Southport in the Northwest UK, and driven by growth, moved 40 miles to Knutsford, another small town, but much better placed for transport by rail, road and airport, and served by both Liverpool and Manchester for access to talent.

Crytek is high profile independent studio, recognised for high-end graphics in the Far Cry and Crysis series of games. It was started in Germany in a rural town called Coburg, but moved in 2006 during the development of the hit title Crysis. The move was a total of 165 miles, or 3 hours by road, to Frankfurt, giving the company access to a much larger talent centre and the best air links in Europe. Their staff, even based in Germany, are extremely multi-national, with 40 nationalities represented, and English is the official spoken language within the studio. Since then, the company has continued to grow to include studios in Kiev, Budapest, Sofia, Seoul and Nottingham.

Seeding second and third locations is a common way of companies growing where the local talent base is either already running out, or is over competed for. However, it has historically been a risky path to follow, and major software corporations such as Google (Googleplex / San Francisco) and Microsoft (Campus / Seattle) continue to centralise their huge R&D departments in single large locations rather than distribute their cultures too widely. In games, there are also plenty of boom-and-bust stories about second studios being acquired or seeded, running for a single title, and then closing – e.g. a most recent example is Codemasters in Guildford, or THQ-Kaos Studios in New York.

Strategy: Corporate Restructuring and Low Cost Locations

Corporate restructuring is inevitable in a fast paced, technology driven, and global industry. Restructuring usually just changes the power balance, reporting structures or divisional accounting, but can lead directly to relocation – most often when a branch is closed, and talent staff are combined into an already existing company site.

Games development is intensive in its use of headcount – the man-hours of digital creators who build games. There has traditionally been much competition to hire and retain skilled staff, but this has led to high fixed costs in salary bills. Games developers will tacitly acknowledge that up to 30% of that salary bill is lost in the 'ramp on, ramp off' of large projects – i.e. staff who are retained on pay-roll, but not always contributing to the current projects. The recent response to this has been to outsource more, but also to invest in large talent pools in cheaper locations.

Leadership structure change can been seen publically when it makes the industry headlines, e.g. at Infogrames, which rebranded as Atari, and moved headquarters from Paris to London to San Francisco. Likewise, Sony Computer Entertainment has had its President of Studios sitting in Tokyo, then London, then San Francisco in the last few years. Other change is more simply interpreted as a reaction to disappointing sales - THQ recently closed down the New York based Kaos Studio, having finished Homeworld, a high budget game that failed to make significant sales. At the same time, THQ also closed a studio in Northwest-England, and announced further growth in Montreal – a low cost, large scale hub for their investment.

One driver for this restructuring is relative regional decline, has been experienced by games companies both Japan and the UK. The UK was previously the third largest player in the games industry, but Canada actually overtook the UK to claim 3rd place around 2008 and both Korean and

Chinese markets are growing to overtake the UK soon, if they haven't already. That has led some publishers to be acquired, and individuals to migrate for jobs as studios have closed down. There is some momentum to this migration, as colleagues moving first might then help recruit their friends in future.

Tactics: Relocation due to Incentives

Tax Incentives aren't really a strategy for relocation - they are better described as being the tactical factor that tilts the decision towards a particular location in the late decision making process. The underlying strategies are almost always a combination of growth and cost-management.

Montreal is by far the most successful region to actually attract relocation from major players – e.g. Ubisoft, Square/Enix, THQ, Electronic Arts have all built large (100's of people) studios there.

What draws these companies? It's not just the taxation, but the total balance of costs against the talent levels available. It's really important that a development location doesn't just save costs, but must actually deliver great games. So the first need for a territory isn't to set incentives, but to attract talent. Many USA states have competed for local business by announcing incentives, but anecdotally, either achieved nothing, or worse still, even been sued by companies that tried to relocate for the credits, then were unsuccessful in securing a pay-out.

The incentive levels themselves are important: with Montreal credits running at 37.5% of production costs, they are worth a huge amount to companies that might otherwise be running at profit margins of +-5%. But recent exchange rate fluctuations around the globe have also shifted currencies +-30% too, so these factors are also important in determining cost to publishers that typically account for their business in Yen or Dollars. The British Pound has swung almost 30% lower against the dollar in the last three years, and this has certainly helped industry in the UK continue to compete, even from an expensive cost base such as London.

Effort of Relocation

Companies know that talent is one of their main concerns, usually alongside product quality, revenue, and cost base. Relocation is highly disruptive to talent, but a clear perspective is needed that often talent moves on every 2-5 years on average anyway. At the end of a long product cycle, there can be a chance to move at a point when a company expects natural attrition anyway. However, moving mid-cycle is definitely riskier (although happens – e.g. Crytek from Coburg to Frankfurt during the Crysis-1 development).

Employee commitment to companies is strongest when there is growth happening, and successful retention strategies become more important during relocation – shares, bonuses and relocation packages help. Companies have even been known to give free-driving lessons to young staff when moving from central town locations with public transport to out of town sites. Employee attitudes to relocation also vary with the employment market – migration across large distances is perhaps most likely to happen when the local prospects really have dried up. Often, games have employed young graduates, who might sometimes stay in the industry for 5-10 years – this puts them only on the edge of having family relocation issues, at which point schools for children become important. The average age of a development studio very much varies depending on which genre it works in – e.g. Playfish is a studio (recently purchased by EA) we interviewed with an average age 5-10 years below its EA counterparts.

Perhaps the easiest form of relocation for a company though, is to acquire a satellite location, based on a previously successful partnership. This is by far the most common mode of expansion for the

large publishers, who are known to snap up hit developers after they prove themselves in the marketplace. That tends to be the major pay-out point for the founders, and typically such studios gradually become less individual, and converge on the acquiring corporate culture, over a period of 3-4 years while share options vest for the founders.

Case Study: International Relocation

Relocation, where a whole company office moves people, and continues operating the same business, is obviously a very common thing during company growth, but typically limited to a range of about 10 miles, within the same company. It is relatively rare to find clear cut examples of corporate relocation in gaming, and even those are often tied to corporate problems – such as redundancies and restructuring. The following example, however, is based on a company in the prime of its success, moving across Europe. Electronic Arts (EA) is an industry leader, positioned historically as the leading console and PC publisher/developer, and respected for its strategic leadership, often setting trends that the rest of the industry will follow.

In October of 2006, Electronic Arts, at the time the dominant player in the games industry, moved its European headquarters from London to Geneva. The official press release, via Reuters, reported '"When Electronic Arts started its European business in the early 1990s, the natural choice was to go to Britain for language reasons," a spokesperson told Reuters. "As the company has grown, it makes sense to be closer to the heart of Europe and be at a more neutral location."' As a corporate commitment, approximately 90 senior management staff were reported to have moved, and the office is still open today, priding itself on a multi-cultural office with more than 20 languages represented. (https://jobs.ea.com/locations/europe/switzerland/)

Anecdotally, employee response to the move was good at the time – EA was the industry number 1 company, and these were typically loyal senior management. Geneva in 2009 was the fourth most expensive city in the world, but also boasted the third highest quality of life in the world. So for senior publishing staff this combination clearly had attractions.

In recent years since that Geneva move, the corporation has experienced high cost growth which has led to loss-making quarterly results. This has led to an new, publicly stated strategy to move investment to low-cost areas – the CFO Eric Brown recently stated that "Twenty-two per cent of our employees are now in low cost locations" and added, "and we continue to move resources from high-cost to low-cost locations".

6.2.5 Relative interest in Malta's value-proposition.

Malta's value proposition is not currently well understood in the games industry. Most interviewees knew about Malta only from general geographic knowledge.. Only one interviewee, an IT specialist, knew about resident industries – he talked about the legal positioning for data-centres, citing a person interest in online-gaming. So conversations centred on the key needs of companies, which were remarkably consistent. The top issue was always talent, with cost and tax-incentives inevitably following in discussions based on particularly regional locations.

Talent

Talent is the number one concern of the games industry, regardless of which part of the value chain we spoke to. Publishers and platform owners admit to paying over-the-odds for their best talent, and very much see their business as about talent-attraction and retention – perhaps even as a more fundamental need than customer-attraction and retention in some cases. This is an understandable perspective when a retail-disc project may take 1-5 years to build, but gain 80% of its revenue in a one month ship window. The immediate question around Malta's talent was about which companies

already existed – like sharks attracted to the smell of blood, there is a sense that a talent pool should generate noise and stories to attract major publisher-developer players. This can be seen even in previously obscure territories – e.g. the animated film Paths of Hate was cited as an example of up-and-coming talent in Poland. From a Maltese perspective, Battlestar Galactica from Bigpoint is the closest example, but as yet, this hasn't got enough recognition to create external interest in the talent pool.

Cost

Cost of employees, and the related cost-of-living they experience is a key factor across the games business at all scales – from individual developers living on savings, to large corporations which are downsizing studios in high cost locations and relocating. Since the industry is highly competitive, and rapidly changing, companies have often found that previously lucrative business can become commoditised and this dilutes profit margins, frequently into loss making territory. One wise warning was heard multiple times during interviews – cost is important, but you can't cost-reduce your way to market leadership, whereas you can cost-reduce yourself to the point where operational excellence is lost. Games typically compete on quality, as the consumer decides what is fun – cost reductions which remove that fun can kill revenues entirely.

Malta is perceived as a low-cost location, which instantly begs the comparison to Eastern European nations. A low cost centre often matters most to industry on a large scale though – i.e. small savings per employee multiplied by a large number of employees. Several companies admit they are running very high cost production teams, with the bulk of their content creation coming through outsourcing. Malta achieves the low-cost attraction for average employees, but currently fails to pair this with the required large numbers of skilled workers in creative disciplines such as 3D art. Low-cost in engineering terms has some other factors – higher education is particularly important, as is communication – with issues both in language and time zone. Hence India, with English as a prevalent language, has become an international centre for outsourcing in software engineering. There are also initiatives in Eastern Europe too to take advantage of the cost base and talent - e.g. Electronic Arts has an office in Romania/Budapest, and Crytek has studios across Kiev, Budapest, Sofia, Seoul and Nottingham.

Tax Incentives

"It's actually good to be taxed" is a lesser heard comment, but genuinely meant. Tax becomes an issue when a business is profitable, so for start-ups, the problem of dealing with tax bills is almost a blue-sky wish. But the business thinking behind the comment was really centring on the idea that building a viable business is important, and generating profit margins, not thinking tax first. Similar advice is found across the financial investment community.

But tax incentives get a lot of games industry attention at the moment. So why does the games industry talk about tax so much? The Montreal phenomenon shows that widely publicised and high value, long standing tax incentives have clearly built a successful industry hub. The press attention coupled with this often centres on whether this growth is a zero-sum game – and evidence points to emigration from France and the UK as fuelling Montreal's growth. There are several large, historically profitable games industry companies with mature business models, currently looking at their increasing cost base, and shrinking margins. One immediate fix is to lower that cost base, and accepting tax credits is a great way to implement this. However, tax credits are not enough – it's still all about the operational execution, which is typically limited by talent. So Montreal wins with both tax credits and talent-base, whereas these same companies are campaigning in their current territories to get new tax breaks – e.g. in the UK there have been campaigns and lobbying from GamesUp, TIGA and UKIE representing the majority of the industry.

So tax breaks are an interesting topic of conversation for the industry, and something Malta should address in its message to attract industry. But when reduced to a calculation on a balance sheet, tax actually becomes a subset of the cost-factor, which is still outweighed by the talent-factor.

Internet Infrastructure

Games companies live in an internet enabled world. IT managers, general managers, and employees care passionately about the quality of their link onto the internet, and boast about it when doing business development. As such, great quality internet is an assumption for the industry, and not having it would be a deal-breaker. So industry demands for good infrastructure in this area should be taken as a baseline requirement, not as something that could differentiate from other locations. There is currently only one area outstanding, where locations are highly differentiated, which is 4G internet access. This is likely to be important across whole economies, rather than being a game industry specific issue, but games have already established themselves as one of the primary uses of mobile smartphones, so it is likely they have a significant role to play here in future. The 4G race will be played out over the next 2-3 years in Europe, as government legislation, wireless spectrum auctions and commercial investments are put in place. Meanwhile, developers are able to use a Wi-Fi wireless network plus good quality wired broadband, or slower top-end 3G services as a temporary substitute for 4G availability to develop forward looking applications. So overall, a good position in the 4G race is likely to enable local games companies, but may not be sufficient to attract them initially.

EU member and Eurozone

Gaming and all related fields of e-commerce rely heavily on micro-transactions, subs, and efficient routes to market. Together, obviously, EU membership and the Eurozone is a distinct advantage for open trade in Malta. This is seen as a stamp of stability and credibility. There was some enquiry as to the stability of the Eurozone from American companies, but this is seen more as a reaction to current news events than a real issue – international games companies still need to trade in Europe which is often the second most profitable market after USA for international players.

A second principal advantage to the Euro as a transaction currency is that website, backend and service providers are already setup to deal with transactions in that currency, and European consumers, even in non-Euro states, are familiar with and trust the currency which they will have used before. This sounds obvious, but surveys on e-commerce show that trust is a key factor in completing transactions online, and even the simplest prejudice or website glitch can cause the consumer to pause and not complete a transaction.

Government Cooperation

Agile is the name of a particular process technology commonly used in games development today, and agility as a concept has strong appeal to games industry people. Hence talking about E-Government initiatives garnered general support from industry, who typically like to see high tech approaches to efficiency, and a very internet-literate population. Malta as a small nation has a real opportunity to outpace the bigger and slower players here. So there is interest in government efficiency. Few games industry players are interested in engaging with government relationships however – the industry is very fast moving and pragmatic, and perhaps more used to rapidly circumnavigating obstacles, rather than building coherent lobbying positions. With fast change and tight margins, most companies simply don't have the structural overhead or scale to engage in the months to years of negotiations they believe would be needed. Most taxation incentives offered to games and media seem to have been supplied by government, rather than demanded by industry. So if interest is to be generated based on the pace of government agility, marketing of case studies and buzz from successful initiatives will be needed.

Environment
Pleasant climate was widely seen as an advantage. Several stories of talent migration cited Los Angeles and the film industry as a place some artists aspire to, in part for the weather. There was one intriguing conversation which suggested that rainy-climates had actually been better for the games industry since it encouraged people to stay indoors, working studiously. However, this is not born out in practise – Austin, Dallas, Los Angeles are all hosts to very successful games industry players. One anecdote was told of a Nordic games company, whose wealthy founders, upon selling the company, had moved as a group to Ibiza for a year to develop a new game, while selecting the location for climate and lifestyle reasons.

Location
Malta is well placed for access to Europe, but access to Europe is not in short supply. Several interviewees hypothesised about Malta as a gateway to Africa, and we have investigated the prospects of the Middle-East too. Currently, South-Africa and Saudi Arabia are typical entry points to these markets, but there is certainly an interest in having a European base for sales operations to North Africa, and a general sense that countries there, over the next decade could become viable markets for games and media. This optimism is perhaps triggered from the recent changes in Tunisia, Libya, and Egypt, which suggest opportunity in the mid-term. Today, these markets are not yet significant, and do not show up on sales charts or on the radar or awareness of interviewed companies. The trends of sales show that the mobile markets will be most significant there first. So there is interest and potential to be a neutral base on the edge of Europe with good trading relations to developing markets, but it is speculative and future looking.

6.2.6 Summary of key interests/concerns.

Talent Gaps
Massive scale is something Malta will never be able to offer. However, a key benefit of scale can be diversity, and diversity is especially recognised and required in the melting pots of high-tech and creative industries. Malta does very well for its language diversity, and has some solid technology working sectors. The gaps are seen most in some of the creative arts – especially, from a games industry perspective, 3D art, animation, technical art and game design – and some of the specialist technologies – especially gameplay programming, and mobile software engineering. Talent gaps can be addressed in the long term through education and in the short term by active companies importing specialists. A strong 'seed' is needed for a culture to grow, and that typically must be paired with commercial success and an economic system that rewards such talent, or emigration will occur, even after educational investment.

Entrepreneurial Culture
San Francisco's Silicon Valley is the envy of the world in terms of entrepreneurial spirit. It's not just a place that invents well, but it also commercialises well. Names like Intel, Google, Facebook have been seeded there as start-ups across the decades, and continue to grow in that environment to become globally successful brands. This is not a coincidence. The culture in Silicon Valley is seeded with enormous talent, easy access to financial capital, a spirit of optimism and risk-taking, and a history of rewards going to the winners. All this combines to support small companies in taking risks and growing. In particular, failure of a business, with associated redundancies, unemployment or bankruptcy, has much less stigma there than experienced in Europe, in fact the learning is appreciated and the emphasis is on failing quickly, learning and rebounding.

These elements are both material and cultural, and a comparison to Malta today shows a more conservative financial lending culture, which leads to slower, more organic growth. In fast moving technology driven markets, such growth is typically not rapid enough. Business is more likely to be family owned, and there is less of a culture of eventual rewards when selling a successful startup – often known as the exit strategy.

Poster-child examples

In the UK games industry, the recent Livingstone-Hope report looked at talent, training and cultural mind-set for the UK investing in the future of creative-technology industries, especially film and games. What is notable, and effective about the presentation, is that it highlights examples of recognisable games (Little Big Planet, Grand Theft Auto) and films (Harry Potter, Inception) which have been worked on in the UK. This message of inspiration is a key part of the report, since in itself, it shows that students and skilled workers don't know what's being done even in their own country, and hence may not recognise their opportunity to aspire to join in. To build a creative centre for industry, even once the infrastructure, incentives, talent and businesses are in place, there is a clear need to publicise and evangelise too. This overall process is called "seeding" and is akin to crystalline growth – an initial high quality seed is needed, which can attract and build a larger entity over time.
The report and video are highly recommended viewing, available here:
http://www.nesta.org.uk/areas_of_work/creative_economy/skills_review

Critical mass & longevity

There is open discussion about how long the Montreal tax credits phenomenon will last, but general agreement that Montreal has now reached a critical scale, so that the games industry there should last for decades from the foundation of today. Other clusters of games companies are under threat, even after a strong history – e.g. the Northwest of England has had a long list of recent studio closures, and TIGA quote the industry shrinking 9% since 2008.

So the debate around seeding new business sectors is about stickiness – when the incentives run dry, or the one-off hit has passed, what does it take to sustain a hub? Will it be easy-come easy-go, or can the factors for ongoing critical mass be sustained? This is a particularly strong concern for gaming sectors. The industry is currently going through an evolutionary spurt, catalysed by computing, internet and mobile technologies. In this period, some large companies will fail, but global growth is strong, and so smaller competitors are constantly popping up to take advantage of new markets, recycling talent to do so. However, this rapid change means that boom-and-bust cycles will occur, and it is a well-recognised management challenge to move from hyper-growth to maturity, while smoothing out the bumps. The challenge for Malta would be not just to attract and grow industry, but to setup stability in the longer term.

A many-layered opportunity

The games industry can be viewed as being several layers, each of which are built on others as a foundation. This is not just true in a traditional value chain way, but with tight and detailed integration required across multiple disciplines, there will be distinct layers even within project teams. For example, an IT/computing foundation to an office, a tools department to create customised workflows, a graphics engine team to render a game, an art-modelling team to create objects, a level-design team to build these into worlds, gameplay/simulation programmers to make it move, design direction to bind it together, project management to bind it all together, commercial management to invest, and marketing/sales to generate interest and revenue. It is by no means rare to see specialisation in industry, but the games industry is more extreme in that several of the skills are particularly specialist and relatively rare or new to the world.

The concern here is that it is not possible to simply build, or import, a fully vertically integrated games industry where one doesn't yet exist. To attempt to do so would spread the effort too thin and be ineffective against more clearly focused external competition. Companies need to focus on what they can do best, and some of that opportunity will be inherent to the region and the talent base. At this point, Malta is stronger at the computing infrastructure end of this spectrum, but weaker in the artistic and design cultures.

The opportunity side of this issue is that a focused investment in building up a games industry is actually about initially building up several individual, more specialist industries: computing technologies; digital creative industries; product development; e-commerce and marketing sectors. To invest in these sectors in the medium to long term, training, education and community will be needed to build a platform of skills and culture which will attract FDI. Many of the resulting skills, as needed by the games industry, will also be strong skills to have in other sectors. In addition as the games industry continues to rapidly expand with new technology and business models and platforms, niche / specialist opportunities may emerge (such as Skills Based Gaming or personal games data security protection to name two) that Malta's strong academic framework and ability to fairly rapidly legislate may assist stimulate business in. In addition in 5 to 10 years Malta's proximity to North Africa and near Middle East will make it an attractive support centre for North Africa and near Middle East.

6.3: Industry Consultations

For the background of this chapter, we performed interviews with director level representatives from a global cross section of top companies. Between them they cover all the major sectors of the games industry value chain and most major game genres. In particular, they cover development, publishing, platforms, distribution, and all games types including casual games, console games, online games, and mobile games. Their combined market strength represents much more than 50% of the total industry revenues.

The important conclusions from these interviews have been noted above in an anonymous way. Interviews were conducted face-to-face, by telephone and at industry conferences. Please refer to the report appendix for more details.

Companies we consulted with included: Electronic Arts, Activision, Sony Computer Entertainment, Microsoft Game Studios, Gaikai, BBC Worldwide, Babel Media, Attachion (German Games Investment Fund), Revolution, Introversion Software, The Walt Disney Company EMEA, THQ, Lionhead, Crytek, Playfish, Codemasters, Supermassive, Perfect World, dtp Entertainment, Crescent Moon, Namco, Atari.

Chapter 7: Gap analysis

Lead Authors: Chris Leebetter, William Latham.

7.1 How does Malta compare to its immediate comparators?

Due to the fledgling state of the games industry within Malta, Malta's island state and Malta's proven ability to react to market conditions to provide a flexible taxation regime, there are no games development territories that are directly comparable to Malta.

Although assessing an island territory that is similar to Malta, such as Iceland, Singapore or Nova Scotia makes sense in theory, in practice it will yield very little of practical use. Iceland has a very small games industry dominated by a single, long-standing and very international company (CCP makers of the game Eve Online) whose success is independent of location and whose sector has received almost no government support and received investment from General Catalyst Partners and Novator Partner. Singapore is close to an island state but is not isolated, differs significantly from Malta fiscally and culturally, is already a regional serving hub, and has a more advanced development and publishing cluster so is not valid as a comparison. Nova Scotia is remote but not an island, has not yet demonstrated the necessary range of incentives beyond a major tax credit, nor has this single incentive been able to build a successful games cluster.

Instead, Malta will be scored against existing games clusters (in chapter 3) to identify how Malta compares today against a number of different criteria seen to be essential to the growth of a successful games cluster.

7.1.1 Cluster Score Comparison

After profiling major clusters in chapter 3, a score was allocated to each one resulting in a total score weighted to reflect the importance of the experienced talent pool.

Using this work as a baseline, Malta has been compared with each of the world class games clusters to identify where Malta is already strong and where Malta will need to make changes to ensure that Malta becomes an attractive location for games developers and games companies and thereby becomes a world class games cluster in its own right.

	Quebec	San Francisco	Seattle	Hamburg	Shanghai	London	Singapore	Seoul	Paris	Malta
Experienced talent pool	6	10	6	5	5	9	2	4	6	1
Raw talent pool	7	10	8	7	8	8	3	6	5	3
Fiscal support (public)	10	1	4	3	2	2	6	7	10	7
Fiscal support (private)	7	10	7	6	8	4	3	8	7	2
Location	5	10	10	7	10	10	2	10	6	5
Local economics / legal	9	5	5	7	8	5	6	8	1	7
Local support network	10	2	1	5	2	4	6	7	5	6
Weighted total	66	68	53	50	53	60	32	58	52	33

Table 7.1 Weighted Cluster Scores including Malta

Below, each criterion is examined to identify the gaps which will provide opportunities to strengthen the Maltese offering and the gaps identified addressed within Chapter 8.

Experienced talent pool

The existence of an experienced talent pool has been identified within chapter 3.3 as a key characteristic of a games cluster of any kind and arguably the most important characteristic of world class games clusters against whom Malta is being compared. Scoring for experienced talent pool is based on the existence, breadth and depth of talent pool across multiple games platforms.

The weighted score comparison above shows that Malta has a significant gap in availability, breadth and depth of talent experienced in game production across multiple games platforms, which is reflected in the low number (5 companies, 2 of which are part-time) and small scale of indigenous games companies identified in chapter 4.3, and the total number of full-time development staff of 27, which is set to fall to 12 in the near future.

Although Malta has some staff with skill sets needed for games production, they do not work in games companies and therefore are both scored and, more importantly, will be treated by incoming games companies as raw talent.

Raw talent pool

The raw talent score is designed to reflect the strength and scale of the flow of graduates from high quality degrees, as well as from other related industries. As well as the gap in experienced talent identified above, Malta also has a gap, albeit less pronounced, in raw talent which is dictated primarily by the strength and relevance to the needs of the industry of the courses offered by its educational establishments, but also by the availability of talent from related industries, both of which are seen as raw talent by games companies. Malta is naturally restricted by its relatively small population and correspondingly low number of educational institutions.

The overview of the local educational institutes within chapter 4.2 showed that Maltese education is in general of a level comparable with other European countries. Maltese educational establishments already offer a range of courses that deliver graduates with degree level skills in programming, mathematics, arts and engineering that supply the market with graduates with strong basic skills. The largest raw talent gap is in the creative digital arts and more traditional visual arts. Chapter 4.2 identified that although the Maltese educational system provides a number of arts courses, the educational system, particularly at University level, does not provide practical courses that develop artistic and creative abilities. In addition, there are no established, dedicated game-specific education programmes, particularly at University level.

Following a recent strategy to align the Maltese educational system with the requirements of the contemporary work-place, a number of courses and initiatives relevant to the games industry have been, or are being, developed by the Maltese educational institutions to address this gap. These include the introduction of new courses at the University of Malta and the programmes offered by MCAST Art and Design. These new programmes are at an early stage and few graduates from these new programmes have yet to enter the employment pool. Malta has recently established a Digital Games Initiative, run by the University of Malta. Events such as this are often seen by the industry as opportunities to judge the strength of the raw talent pool. The games jam run by St. Martin's is a very good way to start to encourage talent As graduates from dedicated games production degrees start to become available, the raw talent pool will become more attractive to the games industry, although we note that Malta's graduate numbers will always make it difficult for companies to establish large scale development facilities.

The talent available from related industries displays much the same characteristics as the student body. Skills gaps are again most notable in Art Roles. In particular Malta has low availability of lead artists, character modellers, animators, technical artists, and concept artists. Chapter 4.1 profiles a digital media production sector that is, for the most part, focused on graphic design and web development. Chapter 4.1 also identified that Malta has some gaps in the availability of talent with technical experience. In particular, Malta has low availability of network programmers, graphics programmers, simulation programmers, mobile device programmers and embedded systems programmers. Appendix 8 Table 8.11b provides a range of Short Courses that could be provided to fill gaps.

The low availability of technical and art talent in related sectors is balanced by stronger availability of customer support, film production location support and localisation services from which some skills are transferable or potentially directly relevant to more specific games companies. There is therefore a moderately good supply of experienced and skilled technical and support staff able to be re-trained to meet the needs of the games industry within a significantly shorter time than it would take to develop artistic talent from the ground up.

Fiscal support (public)
This category reflects the scale, availability and range of public fiscal support specifically designed for games companies. The score comparison above shows that Malta has strong public fiscal support for games companies.

The scoring reflects the availability of games-specific measures in other territories (with best practice reflected in Quebec). These are profiled in detail in chapter 3.3 but are variously games production tax credits, cultural games tax credits, games-friendly R&D tax credits and a range of support measures designed to assist global companies to import specialists to train up raw staff.

Although there are few games specific fiscal measures currently in place, some are in the pipeline, and as a result of government legislation Maltese companies have one of the most tax-advantageous corporate structures within the European Union. This has attracted games company, Bigpoint, albeit for a limited duration, but seems likely to trigger the founding of two new games companies by Bigpoint International's former Producer, in addition TRC Family Entertainment Ltd opening in Malta continues this positive trend. Chapter 4.5 provides an extensive overview of the range of support initiatives that Malta provides for new and existing companies. This range of initiatives, should be sufficient to attract global small / medium games companies with private shareholders. It is understood that customised incentive packages have been offered to large companies such as a major publisher, which even then would still have major concerns about the lack of an experienced talent pool.

Fiscal support (private)
This category scores the scale of local private finance sources and their openness towards funding games companies. Malta does not have an angel investor, venture capital or banking community familiar with the games industry, nor currently one prepared to invest in early stage opportunities or support the later stage investment that is essential to growth of a cluster. However planned improvements in the pipeline from Malta Enterprise should start to address this. This kind of support is relatively rare (it is muted even in the global financial centre of London) and found only in some of the largest clusters.

Companies in most games clusters rely upon and need private finance sources such as angel investment, venture capital and other types of private equity, bank-based loan financing, specialist gap financing, project financing and completion bonds. Without access to finance, whether from government support, from private finance or ideally a combination of the two, the formation of start-up companies and their growth to companies of scale can be limited to organic, 'boot-strapped' (i.e. customer-driven) growth.

This has been recognised by the Maltese government who in 2006 introduced tax credits on venture capital investments and set up Malta Venture Capital plc. with the aim of stimulating venture capital as a means of financing new, high risk, ventures. While this tax credit and company are moves in the right direction, again the availability of risk finance in financial centres such as London and New York has not necessarily triggered higher levels of investment in games companies.

Experience of other successful clusters indicates that early stage risk investment is often made by successful entrepreneurs who have founded and sold on games companies. Clearly, this will not happen in the near term so other mechanisms to support the financing of games companies will be needed.

Location

The weighted score comparison above shows that Malta does not score particularly highly as a location for a games cluster. This is not unusual for inorganically grown games clusters where the stimulus for development is not proximity to existing drivers for games development but a desire at government level to develop high growth, high value new industries.

While Malta is not within close geographic proximity to any of the existing major games clusters, it is close enough to the centre of the European cluster to avoid as low a score as Singapore (which is very distant to North America and faces structural difficulties in trying to establish itself as a development satellite to a Chinese market which does not outsource development). A review of travel connections between Malta and other major games centres in chapter 4.5 shows that Malta is within easy travelling distance from the European games clusters but does not have direct flights or the frequency of flights to the non-European games clusters that other international locations are able to offer. While this is inconvenient, it is not as important in a globalised, increasingly networked market.

Due to its size, Malta is unlikely to be able to offer the volume of skills and experienced resource needed to house the entire games value chain for the local territory but is a gambling industry centre, has existing data centres serving offshore users and has a wide range of language skills. Malta has already demonstrated through the development of a leading position in the global gambling industry that it is able to use tax and other incentives to overcome proximity limitations that being a small island naturally impose. However, we note that the comparison with gambling is problematic as gambling games and operations are not as human resource intensive as games development and operation.

Malta's Island state and geographic position mean that data connections to the rest of the world tend to be routed by undersea cable to Sicily, through Italy and onto the European mainline. Malta has a relatively high latency for communications channels to North America and Japan and the Far East. This may limit the attractiveness of Malta as a location for games companies that require low latency in connections to these locations.

Local economics / legal

This category scores the cluster's salary levels, employment flexibility and quality of life. The overview of the local situation in chapter 4 shows that Malta provides a cost effective base for companies. Malta has competitive salaries, flexible employment laws, a wide range of commercial office space and good business support infrastructure. Malta is able to offer technologically advanced office buildings such as within the Smart City complex located at Ricasoli.

Chapter 3.3 identifies quality of life is a useful feature for games companies to attract employees to a new location. Malta provides an excellent quality of life for employees and has been ranked second in the world in International Living's Quality of Life Index for 2011.

Local support network
Malta has, where possible, eliminated bureaucracy and created clear guidelines and regulations for companies wishing to locate in Malta. Chapter 4.5 gives a comprehensive overview of the extensive support Malta provides to companies wishing to locate in Malta, which contrasts well to some clusters that are either completely lacking (Seattle, San Francisco) or have lacklustre (Shanghai, London) local support agencies.

Malta Enterprise however does not specialise in games, and therefore may struggle to close location deals with major games companies due to a lack of experience in the core drivers behind companies' location decisions. There is currently no industry body such as TIGA or IGDA to build local cross company community and networks. (See section 8.2).

7.2 How appealing is Malta's value proposition to the International industry?

Malta's current value proposition is of low-moderate appeal to the global games industry.
On the positive side, Malta has a range of generic fiscal support measures, medium-good raw technical talent (but in small volume in proportion to many other undeveloped locations), good economics, infrastructure and quality of life, and good generic support from Malta Enterprise. Malta's willingness to craft company-specific fiscal support, while not widely known, will help substantially in opening the door to discussions.

On the negative side, key features that games companies expect to see are currently lacking in Malta's embryonic games industry. The low number of artists and designers professionally working beyond college, small scale talent pool now and in future, lack of games specific degree courses (with some exceptions on courses such as at St. Martins Institute that have games content) and low volume of private financing impacts Malta's ability to attract a global games company to relocate to or open a location with a team of in excess of 100 people. There are indications that this may be improving with the opening of TRC Family Entertainment in Malta with planned recruitment of 100 people.

As a result, if a global games company like Electronic Arts or Ubisoft asked themselves whether they could locate a major (i.e. 300-man) studio in Malta today, the answer would be no. This is reflected in the industry consultation, where almost all global games companies and most games companies overall when asked whether they would consider relocating to Malta responded in the negative.

Smaller, more specialised games companies targeting smaller scale development (on mobile, social network, online and small-form console platforms) or larger companies wanting to hive off portions of the games development and distribution value chain into discrete divisions (such as customer or

community support, localisation, customer relationship management databases or perhaps commercial exploitation) may find Malta's value proposition more appealing. Many network games companies have found that they are recruiting commercial, database, online and analytics staff from gambling companies.

While ad hoc deals may well be possible in the short term, we conclude that a comprehensive, multi-pronged, long-term strategy is necessary to build a cluster of any lasting lifespan, significant scale of employment and company location/formation, with a good prospective flow of tax revenues back to Malta's Ministry of Finance, the Economy and Investment.

Chapter 8: Recommendations

Lead Authors: William Latham, Chris Leebetter.

Introduction

To conclude this report, we have recommended a multi-faceted strategy for Malta to build its games cluster. The strategy is rooted in the best practice identified in Chapter 3 but is appropriate to the Maltese and industry context described throughout the report. The proposed strategy has four main objectives, which combine to create a comprehensive plan for developing a balanced games cluster:

- **Attract global games companies:** Fiscal and other support measures to drive FDI into Malta.
- **Encourage local games start-ups:** Triggering a new generation of games start-ups in Malta.
- **Enhance education:** Enhancing Maltese education to deliver raw recruits for overseas and start-up games companies.
- **Nurture a games eco-system:** The critical role that Maltese Enterprise must play in making all the above strategic objectives happen.

8.1: Attract global games companies

Malta's games cluster can grow fastest by attracting a number of small / medium scale games companies to locate substantial development and / or support operations in Malta, bringing with them experienced staff, technology, methodology and investment. They will recruit locally, transfer skills and technology via training by experienced staff, lend critical mass to an otherwise embryonic cluster and encourage the cluster effects described in Chapter 3.3.1. A small or medium size company with private shareholding will be most likely be attracted by the existing Malta Tax benefits under the range of schemes currently offered by Malta Enterprise. However, as discussed earlier in the report, attracting a console development studio that needs an experienced 100 man team will be a major challenge without very significant incentives given the wide availability of major incentives already provided by many territories. In addition it would likely require a company bringing in to Mata an entire 100 man team with associated relocation costs. The effort of attracting a major developer versus likely reward ratio may make this unattractive though Malta should be prepared to have a package that can be presented as required.

As the industry continues to globalise, Malta could, with the right incentives and support policies, become an attractive location to open development or support teams for major companies, in the same way that Bioware recently opened an MMO support team in Dublin. However industry consultation has shown that global companies will need strong incentives to turn their attention away from the larger, better known locations such as Frankfurt, Paris or London.

Malta's dividend tax has benefitted a small handful of games companies, but none have yet committed major long term investment, although the successful attraction of TRC Family Entertainment Ltd to Malta is a major step forward. While this incentive may be useful in attracting individual CEOs and FDs from privately held, entrepreneurial companies (for instance, Crytek said they were interested in our interviews), it is recommended that additional games specific incentives (detailed below) in particular around additional Cultural Tax Credits (of the type used in France) and R+D Tax Credits (of the type used in Montreal or UK) be added to the offering.

It is important that marketing materials explain how the existing Malta Fiscal Incentives centred on the 5% tax on dividends can bring benefit specifically to games companies. In general, games companies and publishers will be more familiar with the Canadian fiscal offerings which are centred

more around production tax credits so carefully crafted marketing material will need to be produced to educate companies.

It is recommended to start planning early the following scheme ("Conversion Scheme"): In view of the fact that the process of digital games production often takes considerable time from idea development to take to market, the issue of cash flow is often crucial. Financial incentives to contribute towards such costs can determine location decisions. it is therefore recommended that government in some cases considers the conversion all or some of the tax credits accrued from investment aid or R&D aid into cash . The quantum of cash conversion may depend on generation of new job opportunities, enhancement of skills, training and HR development and the credibility and importance of the operation. Setting a specific budget/fund beforehand may be a further attraction to Companies to invest in Malta.

To win such business, Malta needs to offer one or both of the following two fiscal measures, and as many of the support measures as possible.

8.1.1 Bilateral investment deal

The fastest (but not necessarily the cost most effective) way to attract a global games company and kick-start a substantial Maltese games cluster is to strike a big ticket, bilateral deal between Malta Enterprise and a global games company. However as already highlighted, the effort versus reward of attracting a major company in the short / medium term will likely be high compared with the effort versus reward of attracting small / medium companies. In the event a large company is attracted then the type of bilateral deals found in Quebec[106] and Singapore[107], which Malta would need to offer would involve the following commitments:

- Malta Enterprise delivers a multi-million Euro investment commitment as part of a package of other smaller fiscal incentives and related grants (see below under support measures) that is tailored to the needs of the incoming games company. We understand that Malta Enterprise has offered these on occasion but 8.1.2 or 8.1.3 below may be additional components.
- In return, the incoming games company guarantees that it will build a state of the art xxx-man facility staffed by a combination of the company's expatriate experts and local talent, and, ideally, work closely with local universities to raise quality levels and then recruit from their output.

Case studies of bilateral investment deals

Territory	Beneficiary	Measure	Value	Result
Quebec	Ubisoft	Matched funding of new graduate institution linked to local universities	$16m investment by Ubisoft, $5m investment by Quebec	World class finishing school outputting 100 graduates per annum
Quebec	Ubisoft	Production tax credit + investment in infrastructure and training (unspecified) to assist Ubisoft	$500m in tax credits + $25m investment, $1.45bn investment in studio by Ubisoft	2,000 man studio
Rhode Island	38 Studios	Tax credit + funding to relocate large studio	$75m loan guarantee	200 jobs relocated from Boston
Singapore	LucasArts	Unconfirmed multimillion dollar incentive package	Unknown, not released / discussed	75 man studio

[106] See Chapter 3.2.1 under Quebec, Ubisoft case study in 3.3.1 and Other reliefs under Financial support 3.3.3.
[107] See Chapter 3.2.1 under Quebec

		(value and terms unknown)		

8.1.2 Cultural tax credit

A large scale fiscal measure to attract games companies is a tax credit for games that pass a cultural test. The European Commission ruled in 2007 that some games can be classed as cultural products. This effectively exempted such incentives from state aid rules[108], and opened the way for the EC's approval of such a tax credit in France[109]. As approval has already been granted following over 12 months of debate and evidence, it is probable that Malta could fast-track the approval of an identical 20% tax credit by adopting the same (surprisingly loose) cultural test as currently utilised in France[110] to score applicant games. Malta could adapt the legislation providing funding to film productions through the Malta Film Fund, which also utilises a cultural test. This measure could be valued in multiple millions of Euros to many games companies and could work in concert with 8.1.1 Bilateral investment deal above.

Case studies with precedent for cultural tax credit

Territory	Beneficiary	Measure	Value	Result
France	Many games companies	Tax credit worth 20% of eligible games production costs. Eligibility defined by EC-approved cultural test.	€85m (est.) investment by France, versus €285m production budgets from games companies	Unknown impact (reported 30% spike in hiring by Ubisoft France). 80 projects assisted.
UK	Many games companies	Tax credit worth 20%-30% of eligible games production costs. Eligibility defined by EC-approved cultural test.	€41m per annum, versus €514m production budgets from games companies	Not implemented. Cancelled by incoming government.

8.1.3 Support measures

A range of support measures should be instituted to differentiate Malta from other territories also offering big ticket fiscal incentives. The 5% tax on dividends has succeeded in attracting Bigpoint temporarily but, upon completion of their largest game to date, Battlestat Galactica, they moved the majority of the operation to San Francisco, leaving only a few administrative staff in Malta. Following this move, Nick Porsche, Battlestar's Producer left Bigpoint and set up Rock-Solid Games in Malta. This measure, which has drawn some wealthy company owners and serial entrepreneurs, should be maintained over the long term. While this appeals almost exclusively to private shareholders in profitable companies, such people can be key to creating start-ups. One of our international consultation interviews with Crytek indicated that the 5% tax on dividends was attractive to that company if it were considering new locations.

i. Grants to assist companies to recruit and relocate overseas experts to train raw talent as effective incentives that demonstrate Malta understands how games companies choose locations, as found in Quebec[111].
ii. Income tax incentives for individuals tapering over 2-3 years are an effective inducement for experts considering moving to new and less central locations, as found in Quebec[112] and

[108] See Appendix for the complete transcript of the EC approval process, including rationale for the EC's approval of the state aid exemption.
[109] See Chapter 3.2.1 under Paris, and Cultural tax credits under Financial support 3.3.3.
[110] See Appendix for the complete transcript of the approval process, including the cultural test.
[111] See Chapter 3.3.3 under Other reliefs and Foreign specialist programmes.
[112] Such as the Foreign experts fund in chapter 3.2.1

Singapore[113]. We understand that a blanket income tax reduction is being implemented for games designers. Additional assistance for relocating families could also be considered.

Case studies of personal income tax incentives

Territory	Beneficiary	Measure	Value	Result
Quebec	Individuals	Income tax credit for foreign specialist immigrants.	Relief tapers from 100% in year 1 to 25% in year 5	Unmeasured impact but Quebec companies employ hundreds of such specialists.
Singapore	Individuals	Income tax credit for foreign specialist immigrants.	Details of initiative not available	Unmeasured impact but Singapore-based companies employ hundreds of such specialists

iii. Training grants that assist with the cost of licensing software such as software development kits for PlayStation 3 and Xbox 360, as found in Singapore[114] and Australia[115], or online software licenses for Unity, Adobe Flash and leading social game analytics packages such as Kontagent.

iv. Enhance R&D incentives such as R&D tax credits can ensure that more innovation expenditure at lower expenditure levels than currently supported by games companies on software and technology development are eligible for grants, as recently occurred in the UK[116]. An alternative would be to extend the existing Create incentive to cover expenditure up to €100,000.

Case studies with precedent for R&D tax credits

Territory	Beneficiary	Measure	Value	Result
UK	Any company conducting R&D	Tax credit worth 200% of eligible R&D expenditure.	On average 2.9% of games studios production budgets.	Fairly widely claimed but negligible impact (has not stemmed decline in UK studios).
Montreal	Any company conducting R&D	Tax credit worth 40% of eligible R&D expenditure. Cannot be claimed by games company claiming production tax credit.	Montreal do not publish this information	Montreal do not publish this information
France	Any company conducting R&D	Tax credit worth 50% of R&D expenditure (tapering over 3 years).	Total spending of €35bn on R&D (including tax credits) in 2008	2,000 foreign companies used it in 2008.

[113] Singapore offers income tax relief for individuals tapering over 2 years.
[114] Via Singapore's Games Creation Community.
[115] Both Queensland and Victoria offer subsidised SDKs to local games companies.
[116] See Chapter 3.3.3 under Other reliefs and R&D tax credits.

v. Some of the measures designed to encourage start-ups in 8.2 below will also be appropriate for incoming games companies.

8.1.4 Guidance on delivery

We recommend the following delivery guidelines for this strategic objective.

- **Target companies:** In order of priority, recommended targets are:
  - **Online/mobile targets**: Small / Medium scale mobile, online and social games publisher/developers (such as Rovio, Zynga, Playfish and Disney Playdom), interested in utilising Malta's technical capability to create sub-divisions focused on customer relationship management, databases, tools and middleware, and analytics.
  - **Publisher targets**: Malta should approach large scale console publishers (such as Ubisoft, EA and Square Enix) which may consider locating post-production and support functions (such as QA, localisation and customer support) in Malta.
  - **Service targets**: High value service company targets (but fewer in number and mostly small to medium scale) would be QA and localisation (such as Babel), support and community management (such as Crisp Thinking), and mobile social or porting middleware (such as Scoreloop).
- **Bilateral deal**: Malta Enterprise (as already done) should on an annual basis ask potential partners what they want from a location, develop a package around their specific requirements, lending financial support for companies bringing in experienced staff to train raw recruits. The emerging markets of North Aftrica around mobile and tablet could be a motivator for a major company.
- **Cultural tax credits**: We recommend that it is administered to deliver rapid decisions, early acceptance letters against which banks can guarantee loans and to lower the minimum production budget to €25,000 to reflect the small number of micro-studios. The Maltese Government will need specialist games industry, legal and tax advice to construct, plan, seek and gain European Commission approval for and then to implement such a tax credit, which process, even moving swiftly may take 12 months or more.
- **Guidance for all new fiscal measures**: We strongly recommend that Malta Enterprise implement as many of the best practice guidelines for fiscal measures outlined in Chapter 3[117] as possible so that the measures are highly targeted at the needs of incoming, indigenous and start up games companies.
- **New grants**: The Maltese Government may well need specialist legal and tax advice to implement any new grants.

8.1.5 Next steps

To attract global games companies to Malta, two steps need to be progressed in parallel, (1) a pipeline of global companies that are potential candidates to relocate in Malta needs to be created and (2) a range of fiscal measures that can be used as part of the negotiation with these companies needs to be identified, agreed and implemented.

(1) To create the pipeline of candidate global companies the following actions are needed:

Time	Task	Notes
Months 1-2	Create long list of target companies	Identify companies that meet the needs of Malta's games strategy
	Create framework for evaluation	Create an evaluation framework that allows an objective ranking of the long list to

[117] Chapter 3.3.3 The efficacy of fiscal measures represents a best practice guide to creating and administering fiscal support for games.

		identify the target companies. Typically a balanced scorecard approach is adopted
	Review against framework and create short list.	Work up value proposition for each company on shortlist
Months 3 onwards	Create pipeline of global companies that could potentially locate in Malta	Use experienced games professionals to support ME in contacting and negotiating with target companies

(2) Malta Enterprise and the Maltese government have extensive experience of the actions required to evaluate and implement fiscal measures so no action plan is provided. We note that legislation, European approvals and administrative preparation for tax credits may take up to 12 months following the decision to move forward.

8.1.6 Targets and costs

We believe that with the bilateral deal combined with other measures could deliver 2-3 medium sized games companies recruited to locate in Malta within 2 years, bringing between 200-300 new jobs at a cost of between €3m-€20m per annum[118], depending on which of the primary fiscal measures are utilised.

8.2 Encourage company start-ups

This strategic objective targets the establishment of more and larger indigenous Maltese games companies, which will balance as well as benefit from the arrival of larger global games companies. The recently compiled Creative Economy Strategy names digital games as a priority area. Following this lead, the joint expertise of Malta Enterprise and the Culture and Creative Industries working group could be deployed to tackle the development of local start-ups. With this in mind, a range of measures are recommended, which combine to create the environment for more start-ups to be founded and grow beyond their current, embryonic stages.

8.2.1 Start-up stimulation measures

i. The 5% tax on dividends previously profiled is also useful for start-ups by serial entrepreneurs and should be maintained over the long term.

ii. Start-up grants of €25,000-€50,000 to help new companies cover costs of founding the company, salaries, purchasing machines and software licenses and covering other ancillary costs should be provided via a start-up fund valued at roughly €1,000,000 over 5 years[119]. Funding could be 1:1 matched or on a stand-alone basis. Malta could extend the terms of the Innovative Start-Up Grants. This is currently being implemented.

iii. Maintain and expand the Prototype grants of up to €25,000 to help companies build early versions of games before commercialisation, such as Abertay's games prototype fund[120]. The funding could be linked to universities and should be provided on forgivable terms with the expectation that only successful projects repay with modest interest. This is also currently being implemented.

[118] Bilateral deals are unique to the context, incoming company and range of investment secured, so comparators are not useful guidance, but see Ubisoft case studies in Chapter 3.3. France's cultural tax credit is estimated to cost €9,500 / development staff member in France so 250 new development jobs may cost €2,375,000 in cultural tax credits per annum plus additional grants.

[119] 15-30 grants could be disbursed plus administrative costs.

[120] Abertay disburses 6 grants per year from a €3.5m fund http://prototypefund.abertay.ac.uk/funding/ and ties the funding to working with students from UK universities.

iv. A public or joint public/privately funded venture or IP fund (such as the UK's Nesta[121]) would invest in high risk businesses providing low interest, convertible loans targeting innovative games or other creative media companies. A games component disbursing seed funding to a single company per year might be worth €150,000 per annum.

v. Educational / industry cross-over grants (such as the UK's TSB[122]) valued at €100,000-€250,000 will be useful to encourage closer collaboration on technology development with universities in Malta.

vi. Create exciting TechHub like Incubation and Hot Desk facilities, possibly in a central location in Valetta, St. Julians, in Smart City or under the aegis of the Business Support Centre, could provide support for new or incoming games companies over their first 12 months including access to an experienced mentor, subsidised offices, equipment and technology, bandwidth, and software licenses as described in 8.1.4.iv (such as those in Korea[123] or TechHub in London[124]). Flexibility is advocated here, since creative companies can prefer to locate their offices in social and creative hubs, sometimes shunning corporate locations. Affiliate satellite opportunities with organisations such as TechHub should be explored.

vii. The loan guarantee scheme currently provided by the Maltese government should be optimised to reduce the delays and individual risks that are currently suppressing take-up by both companies and banks[125].

viii. A tax credit for VCs or angels to provide early stage risk capital for new companies has recently been put in place which should encourage private finance into games companies.

vi. Maltese Enterprise should actively conduct matchmaking between start-ups and incoming games companies and local banks, funds and finance schemes, expediting the task of finding and applying for finance (which can have too high an administrative overhead for small companies). This could effectively extend the remit of the Business Support Centre. Administrative assistance with EU grants, such as the MEDIA programme and other grants should also be offered.

vii. While there is not enough critical mass for a Maltese games trade body in the short term, we recommend that Malta Enterprise negotiates group rates for Maltese games companies to be affiliated with TIGA126, which can deliver networking, educational links and a range of practical support.

viii. We note that Malta Enterprise already provide trade show attendance grants to the USA, Far East and Europe, subsidising some of the cost of Maltese companies attending trade shows to conduct business and gather market intelligence. Suitable trade shows include GDC, Casual Connect and Siggraph.

ix. Malta Enterprise should release small grants for regular (i.e. monthly) networking events for games and other creative media companies, paying for visiting specialists to give seminars, master classes and workshops to the local developer community. This could be an extension of the scheme offered by the Malta Film Fund.

x. Lack of specific skills in Maltese games companies may necessitate expert grants to enable them to bring in specialists with technology, production and commercial skills to deliver short term consultancy to companies, as found in the UK[127]. This may require the enhancement of Malta's existing Loan of Highly Qualified Personnel scheme.

---

[121] A €375m endowment fund that invests in a wide range of innovation across UK sectors including games. http://www.nesta.org.uk/library/documents/AnnualReport2011web.pdf

[122] See Chapter 3.3.3 under Other reliefs and Educational / industry cross-over.

[123] Such as that offered by KOGIA in South Korea.

[124] http://www.techhub.com/

[125] The UK's Enterprise Finance Guarantee is one model for such guarantees. http://www.bis.gov.uk/policies/enterprise-and-business-support/access-to-finance/enterprise-finance-guarantee

[126] http://www.tiga.org, a UK trade body with European members.

[127] The UK's BIS runs a Grant for Business Investment, which covers some consultancy costs.

8.2.2 Guidance on delivery

We recommend the following delivery guidelines for this strategic objective.

- **Target companies:** This package of initiatives is designed for new and existing Maltese games companies. Although these measures are designed for companies working on any games platform or service sub-sector, they are likely to be utilised in start-ups working on mobile, online PC, social and short-form console (e.g. Xbox Live Arcade and PlayStation Network) games. We note that, in the service category, support and community management companies (such as Crisp Thinking) requiring strong language and interpersonal skills but less/no development skills would be well targeted at Malta's current raw talent pool.
- **New grants and funds**: The Maltese Government may well need specialist legal, tax and games industry advice to plan and implement any new grants and funds.
- **Guidance for all new fiscal measures**: We strongly recommend that Malta Enterprise implement as many of the best practice guidelines for fiscal measures outlined in Chapter 3[128] as possible so that the measures are highly targeted at the needs of incoming games companies.

8.2.3 Next steps

To encourage company start-ups the main step is the creation of a range of fiscal measures that target games companies alongside provision of incubation facilities. Section 8.2.1 above clearly identifies the start-up stimulation measures that should be considered for implementation in as short a time as possible. Malta Enterprise and the Maltese government have extensive experience of the actions required to evaluate and implement fiscal measures so no action plan is provided.

8.2.4 Targets and costs

The range of measures include existing incentives which we cannot cost but we believe that the combined cost of 8.2 is likely to be between €1,000,000-€2,000,000 per annum. The combined initiatives should initially deliver between 3-5 small sized games company start-ups and 15-50 new jobs per annum. This should be expected to rise to 5-8 start-ups per annum and 30-80 new jobs in years 3 and onwards. We note that there are unknown time frames to set up the legislative and governance frameworks for some of these new measures.

8.3 Enhance education

This strategic objective is designed to provide the third eco-system component, a strong flow of graduates from generic and games-specific degree courses to supply the requirements of both incoming and start-up games companies.

8.3.1 Educational stimulation measures

i. A range of improvements are recommended to Malta's current courses, such as adding new categories of class and courses, adding dedicated games courses at BSc and BA level, enhancing existing courses to bring them up to date with current industry requirements and adding a Masters-level course. These are discussed in detail in appendix[129] in addition the provision of short courses is identified in Table 8.11b which could be taken educational students in addition to individuals from companies to enhance skills.

ii. Salaries for Art, Modelling, Animation and Design instructors for courses linked to Computer games and animation at MCAST need to be uprated to bring them in line with average salaries for such tutors at other European and USA universities and enable MCAST to attract

[128] Chapter 3.3.3 The efficacy of fiscal measures represents a best practice guide to creating and administering fiscal support for games.
[129] See Chapter 8 Appendix Recommended changes to Maltese games education.

top quality instructors to move to Malta to help reverse the deficit in the raw talent pool for art, animation and design. This recommendation is also discussed in detail in appendix[130].

iii. Grants should be provided to allow universities to source foreign experts in novel subjects (for instance, HTML5, LLVM or Flash 11 development, social games design, games analytics, new commercial models) to teach short courses at Maltese universities. Courses could be subsidised for students. See Appendix 8, Table 8.11b

iv. Subsidised distance learning initiatives (such as that provided by Train2Game) could prepare generalist students for games production.

v. A university twinning scheme that links Maltese universities with best-of-breed games degree courses (such as Abertay University or DigiPen) could raise standards via student and faculty swaps.

vi. A team of students could be funded to enter Dare to be Digital[131] or Global game jam, which will give valuable team production experience under time pressure.

vii. Malta Enterprise should expand support of the Game Dev Challenge (run by St Martin's) or Gamezing competition (run by University of Malta) and expand sponsorship each year by offering a financial prize such as a year's worth of funding worth €25,000 for the winning entry to enable the winner to build out, commercialise and distribute the game. Subsidise internships between games degree students and local games companies, such as commonly found in UK and US games degrees.

8.3.2 Guidance on delivery

We recommend the following delivery guidelines for this strategic objective.

- **Create games specific courses:** The available games related courses identified in section 4.2 should be reviewed and adapted to meet the needs of the games industry. In particular:
    1. **Enhance existing courses:** Focus on adding general courses on game development to augment the current non-game related art, design, computer science, and management majors. Augment the art majors with some specialized games courses that focus on game tools and technology, level building, creating 3D characters. Augment the Computer Science majors with courses on game platforms, game engineers, game middleware.
    2. **Introduce emerging technical areas into courses:** for instance, HTML5, LLVM or Flash 11 development, social games design, games analytics, new commercial models.
    3. **Create new courses focussed on game development:** The course recommendations for Malta Universities identified in Appendix 8, Table 8.11b should be reviewed and implemented.
- **Enhance salaries**: Review the salary structure at MCAST and other institutes to make local salary scales in specific shortage areas such as: fine art, 3D Modelling and animation (including Max, Maya other packages), Game Concept art and life drawing, Scripting and basic programming, Game Design and Level design. (Using Unity, Unreal or similar), Game Production and Management. (Including MS Project and other tools), sufficient to attract quality teaching staff from abroad.
- **Provided Targeted Grants**: Providing grants to attract foreign national teaching staff and to subsidise distance learning and other initiatives may well need specialist legal and advice.
- **Create Industrial links and showplaces.** Malta Enterprise should take a lead role in forging the relationships between the emerging games industry and the educational institutes.

[130] See Chapter 8 Appendix Recommended changes to Maltese games education.
[131] http://daretobedigital.com/

8.3.3 Next steps

Time	Task	Notes
Months 1-3	Full Review of existing courses in Malta at all institutions.	This report will provide a sound foundation for the initial analysis required but additional detailed consultation will be required with each of the educational institutes as part of the review process.
	Consultation with local Malta games companies on short course content and needs.	This should be carried out under the aegis of Malta Enterprise but may need input from experts with experience of the needs of the games industry.
	Establish Industrial links for student placements.	This should be carried out under the aegis of Malta Enterprise using external industry professionals to make and build necessary links
	Establish Education Advisory Panel with industry professionals from abroad combined with Senior Malta Academics to advise on course content and future strategy.	Once established, this panel should continue to act as a 'steering group' on educational strategy to meet the needs of the games industry.
Months 4-6	Liaise with software / hardware providers to create links between companies and academic institutes. Where possible, negotiate provision of equipment and materials to assist in providing 'cutting edge', hands on, practical elements within training courses and sign Academic Partner Agreements with those providers.	Target larger companies with a track record of working with academia, such as SONY, Microsoft, Unity, IBM, Sun Systems, Typically, these companies are able to provide, development systems, game Engines, hardware, etc., on a subsidised or gift basis.
	Selected academics from Malta Institutions attend Games conferences with strong education content (e.g. SIGGRAPH, GDC) which also serve as opportunity to liaise with industry as required.	Although funding to support attendance of conferences and other events would normally come from the University, it may be necessary for additional subsidy to be provided by Malta Enterprise.
Months 5-12	Define a short list of new courses and enhanced courses across institutions produced with costs for review the games advisory panel.	This work builds upon the review of existing courses (above). This report will provide a sound foundation but additional detailed consultation will be required with each of the educational institutes as part of the review process. We would expect that a minimum of 5 specialist courses and 1 master class series will be run per annum. We would also expect provision of a minimum 5

Time	Task	Notes
		additional modules for existing BSc and MSc courses.
	Selected new short courses are set up and start to run.	Typically new courses start to run at the start of the new academic year (2012-13) but it would be beneficial if this timeframe could be shortened.
Months 13-24	Establish one new Games Focused BSc Technical Course, one New BA Focussed on game art, animation and design at MCAST and one new Games Focused MSc at the University of Malta	The educational advisory panel established above should assist with course content.
Months 25 – 36	Initiate PhD research programmes and join EU bids with academic partners at academic institutions across.	This creates a strong research context and manpower that can be move into industry as new opportunities arise in the games industry.

8.3.4 Targets and costs

The range of measures including setting up and staffing new courses and reviewing the salary scale to address specific shortage areas but excluding provision of grants is likely to be between €300,000-€500,000 per annum. The combined initiatives should initially deliver up to 20 graduates ready for employment in the games industry within the first 36 months. Thereafter, the Maltese educational system should be able to produce between 30 and 60 graduates annually. We note that there are unknown time frames to set up the legislative and governance frameworks for some of these new measures.

8.4 Nurture a games eco-system

Malta Enterprise is the critical facilitator of the above strategy, which will combine to create a viable and self-sustaining games eco-system with a balance of global and local companies in the medium term. Malta Enterprise will need to learn from other local support agencies' experience (described in detail in Chapter 3) of growing inorganic games clusters by attracting games companies. In doing so, it will establish new skill sets and methodology, build understanding of the key drivers behind global games companies' location decisions, build contact networks and then sell Malta into key decision makers in global companies, and ultimately drive all three strategic objectives forward.

8.4.1 Key functions for Malta Enterprise to attract games companies

i. **Research**: The support agency will need to perform some research functions to prepare its sales materials (see 8.4.2 for sales channels) in the following areas:
   - Define key fiscal measures. (Completed)
   - Gather data on the raw talent pool, including the scale, range, skill sets and quality of output from local universities.
   - Gather data on the experienced talent pool, particularly local companies of global prominence, including the spread of genres and platforms.

- Gather data on local economics, salaries, office costs, cost of living, labour mobility, IP protection and infrastructure. (Completed)
- Gather the latest research on the industry and then scan games industry news so representatives are up to date with the latest industry trends, practices and concerns. (In progress).

ii. **Sales and promotion**: Key sales and promotions functions are as follows:
- Identify and sell to global games companies.
- Promote key fiscal measures to target companies.
- Promote the raw talent pool, including the scale, range, skill sets and quality of output from local universities.
- Promote (when appropriate) the experienced talent pool, particularly local companies of global prominence, demonstrating a spread of genres and platforms.
- Promote cultural proximity between location and incoming company, local economics, salaries, office costs, cost of living, labour mobility, IP protection and infrastructure.
- Reflect the latest industry trends, practices and concerns in its dealings with games companies.

iii. **Administration**: A range of administrative duties such as:
- Drive forward measures from this strategy through legislative and administrative processes.
- Administer and disburse fiscal support, particularly the primary tax credit measures in 8.1 and related grants (such as the training or specialist immigration or relocation grants under support measures in 8.1.4 and 8.2) for incoming, existent and start-up games companies.
- Solicit, process and implement feedback from industry about companies' concerns, triggering new programmes and support if appropriate.
- Ensure the retention of companies over the medium to long term by establishing close links and scheduling regular meetings.

iv. **Facilitation**: The agency will need to provide a range of facilitation functions, such as the following, some of which could be handed over to a trade body once the cluster has built critical mass:
- Facilitate access to finance either via bilateral deals with senior policy makers or via other tax credits, plus support measures identified in 8.1.1-8.1.4.
- Match-make and facilitate additional support measures (such as other grants, incubation facilities, loan guarantees, and other similar measures from 8.2.1) on behalf of games companies.
- Match-make incoming companies to local private financial institutions, assisting them in sourcing financing solutions including loans and working capital.
- Help incoming companies find office space and local recruitment agencies to source local staff, and assist with local bureaucracy such permits, labour laws and other paperwork.
- Encourage and stimulate industry-university collaboration through the various schemes listed in 8.3.1 (such as facilitating internships and sourcing university twinning schemes).

8.4.2 Guidance on delivery

We recommend the following delivery guidelines for this strategic objective.

i. **Research**: Key representatives must be identified to operate this strategy, who will then be responsible for maintaining industry research. This report delivers most if not all of the data required for the first 1-2 years of operation of the strategy, but it may need updating from years 3 onwards due to the rapid pace of change in the industry.

ii. **Sales and promotion**: To accomplish the above, the support agency will need to establish sales and promotion responsibilities, ideally appointing 1-3 roving sales representatives tasked with promoting and selling Malta via the following channels:
   - Trade show attendance requiring booths, leaflets[132] and meetings and, if appropriate, presentations).
   - Trade magazine and website advertising.
   - Invitations to companies to visit made during meetings or, with much lower efficacy, via cold calling companies.
   - Press releases, reports and local company news.

iii. **Administration**: A core team must be the engine of the strategy liaising with policy makers and government departments to carve out clear responsibilities, budgets and control over key areas of the strategy, particularly administration of fiscal measures

iv. **Facilitation**: Members of the core team will need to become highly familiar and stay in continual contact with local games and creative media companies, as well as sources of private finance and other local support companies to ensure that their changing requirements are understood and, within reason, catered to.

8.4.3 Next steps

The initial actions required to create a team within Malta Enterprise focused on nurturing a games development eco-system are provided in the table below. These measures are necessary to support the attraction of global games companies to Malta (section 8.1), encourage creation of start-up companies (section 8.2) and liaise with educational bodies to ensure that education is enhanced (section 8.3).

Time	Task	Notes
Months 1-3	Identify the 'Digital Games' team within Malta Enterprise who will be responsible for research, sales promotion and administration	It may be necessary to recruit individuals with the right skill set or use experienced consultants if these skills do not exist within Malta Enterprise. This will extend the time frame
Months 4-6	Research team to create the base information and promotional materials needed to support sales and promotion	The sales and promotion team will need collateral in the form of leaflets, presentations, detailed databases of skillsets available in Malta, etc to use when at trade and other shows and when meeting with prospective FDI candidates and with existing companies in Malta
Months 7-8	Sales and promotion team to create an engagement plan clearly identifying how they will identify and meet the games industry needs and will provide a 12 month activities plan and budget	Malta Enterprise will have standard processes and documentation required that are used within annual strategic path and budget setting
Months 9-21	Core team to reach agreement with policy makers and government departments on available budgets and governance	A key step in simplifying and speeding up the provision of fiscal support to games companies is control over key areas of the strategy, particularly administration of fiscal

[132] An example from Quebec: http://www.investquebec.com/documents/en/publications/BrochureGaming2010_en.pdf

	of fiscal measures.	measures within Malta Enterprise

8.4.4 Targets and costs

We believe it is appropriate for Malta Enterprise to cost and define targets for delivery of the above strategy after consultation and agreement with policy makers.

8.5 Speculative opportunities

The measures identified above are recommended as the core features of a strategy to attract games companies to locate and start-up in Malta.
However, we have identified some more speculative opportunities which may become more viable in time and could mature into specialties for the future Maltese gaming industry.
Malta's small but adaptable manpower pool with good software engineers and good universities combined with Malta's fairly rapid legislative process means that Malta could quickly capitalise on new opportunities that are emerging from the rapidly growing but fragmenting worldwide games industry.
The potential emerging opportunities identified in this report that Malta could potentially capitalise on in future are:

- Mobile Broadband and 4G: Malta's early adoption of 4G could ensure that Malta becomes a testing ground for 4G and a focus of 4G application development in advance of other European territories, where adoption is slow.
- Skill Gaming: Although Skill gaming is a low growth, low value, mature games sub-sector with mostly zero regulatory barriers to entry, Malta's expertise in gambling, 'sealed servers' and monitoring may become transferable and so this sub-sector should be monitored in case of sudden late growth.
- Cyber-Security: Large scale loss of personal data by games and other companies recently shows this problem is acute but hard to address. It is not clear how Malta could build a defensible speciality in this area, but with Malta's legislative and enterprise flexibility, it could possibly create a centre of excellence.
- Virtual goods and taxes: As the value of the market for virtual goods, including those sold untaxed between individuals, increases, Malta's legislative flexibility and skill in navigating the tricky international legislative environment around gambling may become more useful as the area of tax law surrounding virtual goods is opened up by games and other companies.
- African and Middle Eastern markets: North African and Middle Eastern games markets, while tiny at the moment, may mature over the long term (5-10 years) into markets for mobile and tablet-based gaming. Taking example from Dublin, Malta's call centre experience, online gambling expertise and multi-lingual population could allow it to build a similar proposition targeting support for support centres targeting these and other markets.

By ensuring that these new areas are monitored or possibly taught in Maltese educational institutes alongside more standard new technologies such as Flash 11, HTML 5.0. Maltese graduates could build a lead against graduates of other academic institutions in other parts of the globe. This could give Malta the foundation needed to capitalise on new opportunities as they emerge. Though it is likely that these new emerging opportunities will remain niche in the medium term, they may be adequate to generate a good number of jobs in Malta. It is recommended an Advisory Group is formed of games specialists and academics to identify trends ahead of time, and identify whether a trend is suitable for Malta to act upon via a Quarterly Strategy report.

