On Materiality: An Analysis of the Medium's Role in Electronic Literature

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A dissertation submitted in fulfilment of the requirements for the Degree of Master of Arts in English (stream/course) presented in the Department of English, Faculty of Arts, University of Malta

June 2023

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Acknowledgments

I would like to thank my family and friends for their constant support and reassurance throughout my academic journey so far: my grandfather Godfrey Xuereb, my grandmother Josephine Xuereb, my father Shaun Mawdsley, my mother Fleur Mawdsley, my sister Amy Mawdsley, my brother-in-law Mark Debono, my nephew Tyler, and my loving partner Kyle Zammit.

My utmost gratitude also goes to my supervisor Dr Mario Aquilina, who not only inspired my love for Electronic Literature, but who provided me with guidance, encouragement, and valuable feedback throughout the writing of this dissertation and along my academic journey at the University of Malta so far.

I cannot help but to also acknowledge the E-Lit creators and theorists, who have pushed boundaries and made literary experiences all the more exciting.

Abstract

How does materiality in electronic literature affect the literary experience and our relationship with literature? In an attempt to address this question, this dissertation explores the field of electronic literature through the work of theorists like N. Katherine Hayles, Nick Montfort, Noah Wardrip-Fruin, Roberto Simanowski, and Jeremy Hight. It offers a close analysis of _][ad][Dressed in a Skin C.ode_ by Mez Breeze in the first chapter; *Between Page and Screen* by Amaranth Borsuk and Brad Bouse in the second chapter; and *34 North 118 West* by Jeff Knowlton, Naomi Spellman, and Jeremy Hight in the third chapter. It shows that by investigating the materials through which e-lit is configured and experienced, the role and influence that materiality has on the literary experience and the relationship between readers/users and literature can be understood further.

The first chapter will discuss the machine as medium through its software and hardware. Both components are made up of multiple layers which communicate with each other and with the human agent, all of which are vital parts of the computer's materiality. Given technology's ever-evolving state, however, one may question what happens when a work's platform is no longer supported by the latest software and hardware and must attempt to be preserved.

The second chapter will examine works that rely on collaboration between the machine and the human in order for the work to be experienced. It will analyse society's relationship with traditional print literature, and compare how that relationship has changed as a result of E-Lit. This is exemplified through skeuomorphs, which act as an intermediary between print and digital literature, thus affecting our relationship with both mediums.

The final chapter will move onto E-Lit which uses the human as a physical vehicle. This focus on the spatio-temporal place in which E-Lit exists through the body highlights both a greater emphasis on user engagement, as well as on the body as material through which the work would

not function without. While there are limits to the human's agency in these works as their bodies act as corporeal intermediaries between the digital work and the physical world, the user's will to engage with and enjoy the work is ultimately quite important.

E-Lit's playful materiality therefore urges us to re-examine our relationship with literature, the 'literary', the printed book, and the technological medium, both individually and collectively, as it draws attention to how these relationships evolve in today's digital society.

Table of Contents

Introduction

From centuries past to today's contemporary society, books have always and currently continue to act as the primary physical representations of literature. It is the familiar medium we turn to in order to experience the literary. Having typically started engaging with books at quite a young age, we immediately recognise the well-known smells and textures, and are fully aware of how books should be engaged with. Due to this normalisation and familiarity, the effects of the physical features of engaging with literature in the overall literary experience are often forgotten, even more so as most traditional literature does not attempt to bring awareness to its medium, but instead aims to engross the reader within the fictional world described on the pages. Of course, this is not so for all print literature, as, for instance, one of the main distinguishers of a postmodern text is its use of metafiction, which continuously reminds the reader that what they are reading is fiction in a book, not reality. It is thus important to think about how the materiality of literature influences a reader's experience in interpretation and meaning-making, a point which has become even more relevant with the rise of Electronic Literature (E-Lit) and the digital medium. This 'digital born' literature playfully utilises the affordances brought about by technological advances to provide users with a new multimodal and multisensorial experience with literature, be it through a computer, mobile phone, projector, or augmented reality equipment.[1] With the birth of E-Lit came the need for a new way of analysing the literary, now with a larger focus on the medium through which the work is experienced, due to the shift from the familiar print to the unfamiliar digital device/s. Known as 'media-specific analysis', it acknowledges the way in which literature's materiality affects how one engages with and interprets literature in the digital age, as well as how they influence the relationship between users and the print and digital mediums themselves.[2] This newfound

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[1] N. Katherine Hayles, *Electronic Literature: New Horizons for the Literary* (Indiana: University of Notre Dame Press, 2008), p. 3.
[2] N. Katherine Hayles, *Writing Machines* (Massachusetts: MIT, 2002), p. 6.

focus on literature's materiality also urges us to reevaluate certain definitions surrounding 'literature' and 'literariness', as E-Lit blurs the lines between disciplines and forms. Even the term 'materiality' is not as clear-cut as one may have thought. It encompasses multiple layers and is understood differently by different theorists, thereby adding ambiguity in attempting to analyse a work's materiality and how it interacts with the user, especially with E-Lit which brings together various mediums that are not all necessarily digital.

Defining 'Materiality'

According to Thomas Bremer, materiality in relation to literature can be seen from two different views: 'materiality of literature', and 'materiality in literature'.[3] The former relates to the 'visible and tactile' aspect of literature, that is, the physical form in which a book (the medium of traditional print literature) conveys the literary spirit of its author through design, typography, use of imagery, and other aspects. On the other hand, materiality *in* literature reflects the way in which things are represented in a text. Materiality is not just about the tangible material on which text is written, but how that material contributes to the semiotic message within the writing. Thus, both the text itself and the way in which it is presented (its material) are vital to meaning-making. As Bremer states, it is the 'interplay of materiality and text' which creates these multiple layers of meaning and add to the user's overall experience of a literary work. [4]

Alternatively, Theresa Schilhab, Anezka Kuzmikova, and Gitte Balling take a more metaphysical approach to materiality than Bremer. They argue that there are two dimensions to the materiality of reading print: the spatio-temporal and the imaginary.[5] The former signifies

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[3] Thomas Bremer, 'Materiality and Literature: An Introduction', *Neohelicon,* 47 (2020), 349–356 <https://doi.org/10.1007/s11059-020-00566-7>.
[4] Bremer, p. 350.
[5] Theresa S. S. Schilhab, Anezka Kuzmicova, and Gitte Balling, 'Decreasing materiality from print to screen reading', *First Monday,* 23 (2018), <https://www.researchgate.net/publication/328095774_Decreasing_materiality_from_print_to_screen_reading>.

the way that texts and human bodies exist in time and space, and can therefore physically interact with one another through the tangibility of the book and the body's senses. This aspect of the experience of reading affects the understanding of the work as a whole and can be further split into two levels: the macro level, which refers to significant aspects such as the environment in which one is reading a book; and the micro level, which pertains to the neuronic level through which the mind makes certain connections during a book's reading which alters the overall literary experience of that book. Both of these contribute to the differing reaction or experience of a novel by different persons who have read the same book. Conversely, the imaginary dimension of materiality implies that the fictional worlds of texts invoke a sensation in the brain that causes physical bodily responses as if the reader is actually experiencing that which is told in the story, due to the immersion within this imaginative world. Thus, materiality may not only refer to the physical components of the book and the reader's relation to them, but also the corporeal reaction to the literary work that the body involuntarily, and often unknowingly, experiences. Although the latter is undeniably an interesting point for further discussion, this dissertation will mainly focus on the spatio-temporal aspect of the materiality of experiencing literature, and it will argue that the human body has become more central to engaging with E-Lit on a corporeal level.

While Schilhab, Kuzmikova, and Balling split the term 'materiality' based on dimensions, Matthew Kirschenbaum views the 'materiality of literature', to use Bremer's term, as split into two types: forensic and formal. Forensic materiality, a term he coins in his 2012 book, *Mechanisms*, is one of the methods which he uses to analyse media.[6] It refers to the investigation of books (as physical objects) and computers (as devices) which are used to display media-specific works. Forensic materiality places its focus on the physical properties

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[6] Matthew G. Kirschenbaum, *Mechanisms: New Media and the Forensic Imagination* (Massachusetts: MIT Press, 2012), p. 24.

of the book and the computer's hardware, including, for instance, how a computer reads and interprets code, the parts of materiality which go beyond what the eye can see. Within the same work, Kirschenbaum also draws attention to another, more visual, aspect of materiality: that which focuses on display and appearance, known as 'formal materiality'. Once the computer comprehends and interprets the code, what it displays on the screen is what has been translated to be understood by humans. This final visual representation of the multi-layered process of the machine projected on screen for users to interpret also makes part of the material.

Unlike Kirchenbaum, who is more specific as to what contributes to a text's materiality, Mark Hansen explicitly views materiality as an event that happens.[7] Working within the studies of new media theory, Hansen understands materiality as a realm of experience which is experienced prior to any linguistic involvement. The space in digital media in which computation takes place is always already embedded with social and cultural contexts, which in themselves create meaning and which are embodied within users, thus creating an event in the initial interaction which Hansen considers materiality. Although Hansen mainly works within the context of the digital arts, the same reasoning may be applied to the specific field of E-Lit studies.[8]

Possibly the most well-known theorist who approaches the topic of materiality in both E-Lit and posthumanism is N. Katherine Hayles.[9] At the start of her influential book, *Writing Machines,* she asks 'Why have we not heard more about materiality?', arguing that literary studies, unlike other areas, has been more than comfortable with focusing the analysis of literature on the narrative it tells while disregarding the vehicle through which it is being told – the medium.[10] In Hayles's texts, materiality is defined as 'the interplay between a text's

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[7] Mark B. N. Hansen, *Bodies in Code: Interfaces with Digital Media* (Oxfordshire: Routledge, 2006).
[8] Mark B. N. Hansen, *Embodying Technesis* (Michigan: University of Michigan Press, 2000).
[9] N. Katherine Hayles, 'Electronic Literature: What is it?' (2007) <https://eliterature.org/pad/elp.html>.
[10] Hayles, *Writing Machines*, p. 19.

physical characteristics and its signifying strategies'.[11] It is the connective tissue which joins the physical and the mental, both the human's and the machine's. Similar to Hansen, Hayles views materiality as something which happens, an event. Yet she takes it one step further than Hansen to argue that it is a continuous event which occurs throughout the dynamic interaction between the human and the machine. This reasoning also extends to Hayles's views on E-Lit itself as an event, since it is something which happens in the now while users are interacting and experiencing.

Hayles is therefore interested in works which draw attention to their materiality so as to highlight to users that the way a text is displayed is as important as the text itself, since it adds to the understanding and experiencing of the work. This changes the way we think about reading, from the conventional definition associated with traditional print to the novel ways of 'reading' a text through new, digital materials. And with the growing popularity of E-Lit, as Hayles argues, 'we can no longer afford to ignore the material basis of literary production'.[12] Thus, for Hayles, materiality does not just signify a change in form – in what tools are used to produce and distribute the literary work – but also a change in how we think about literature, what it is and what it can do, and therefore how we approach it, how we experience it, how we study it. Materiality in studies of digital literature is not simply a buzz word, but a concept which has changed and is continuously changing studies of literature in the contemporary age.

Understanding 'Material', 'Medium', and the Human's Role in Embodied E-Lit

Whereas materiality of literature in this dissertation refers to the concept of the interplay between tangible and intangible objects to create a literary experience and the user's experience in relation to those objects, the word 'material' is defined differently. While standard use of

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[11] N. Katherine Hayles, 'Print Is Flat, Code Is Deep: The Importance of Media-Specific Analysis', *Poetics Today,* 25.1 (2004), 67–90.
[12] Hayles, *Writing Machines*, p. 19.

the word denotes any physical object made of matter, throughout this dissertation, 'material' specifically refers to the tangible objects (hardware) directly involved in providing a literary experience, be it a book, computer, VR goggles, or mobile phone. Therefore, when a work draws attention to the fact that certain materials are being used and how they are being used, they are highlighting the role materiality plays in the literary experience as a whole.

While 'material' and 'medium' are often used interchangeably to refer to the object which provides the literary work to users, 'medium' has come to be more complex in its use due to the way it is defined by theorists of different disciplines. The theorist whom it is most commonly tied to – Marshall McLuhan – uses the word in his well-known phrase 'the medium is the message'.[13] In communication studies, McLuhan's term refers to the 'medium' not to signify the object itself (as 'material') but to that through which a message, such as mass media for instance, can be communicated. In the same field, language itself is also thought of as a medium since it is the vehicle for the message in whichever way it is communicated. Literary scholars Hayles[14] and Kirschenbaum[15] view the term differently, both from McLuhan and from one another. Their definition of medium matches what is typically thought of as medium in society, that through which something is produced, be it the pen used to write a poem or the software used to code an E-Lit work. Jay David Bolter and Richard Grusin's interpretation of the term mirrors Hayles's and Kirschenbaum's, but in their analysis in *Remediation*, they delve into the medium not just as what it is, but also what it does and how that changes based on the properties of specific mediums.[16]

Yet, an issue arises here when considering where the human lies in the midst of these definitions. If one should create a check list of what constitutes as 'material' or 'medium' –

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[13] Marshall McLuhan, *Understanding Media: The Extensions of Man* (New York City: McGraw-Hill, 1964).
[14] Hayles, 'Print is Flat, Code is Deep'.
[15] Kirschenbaum, *Mechanisms.*
[16] Jay David Bolter and Richard Grusin, *Remediation* (Massachusetts: MIT, 2000).

tangible, made of matter, and directly contributing to the creation of the literary experience – one may logically place humans in those categories as well, as they too are tangible, made of matter, and directly contribute to the literary experience. However, human-centredness in E-Lit is more so thought of through the concept of 'embodiment' rather than thinking of the human as a 'material' or a 'medium'. Some works of E-Lit utilise the senses and the physicality of users both as part of the work itself and oftentimes to create an added layer of meaning. From interactive installations to wearable technology, these creative works highlight users' unique abilities as humans to move around freely and utilise their senses, while making them aware of how their bodies contribute to the work's production. Written about by leading theorists such as Hayles and Hansen, the theory of embodiment is not only one which is relevant to E-Lit studies, but also central to posthumanism. The term 'embodiment' may signify the corporeality of beings and their cognitive functions as well as how cognitive abilities and consciousness can now be thought of as disembodied since they are no longer tied to the body, but are being programmed into digital innovations such as artificial intelligence.

This idea ties into another key concept which Hayles presents in her seminal book *Postprint* – that of 'cognitive assemblages'.[17] Due to both the human user and the machine having cognitive abilities, the two communicate with one another in order to perform desired actions. Despite claiming that both the human and the machine are cognitive, Hayles makes a distinction between the two. While she equates the machine's cognition with its ability to process information, make calculated decisions, and carry out tasks (all of which are akin to the abilities of the human), the machine's disembodied nature makes it distinct to the human. Hayles claims that humans' cognitive processes are very much intertwined with the body, emotions, and the social and physical environment around them, all of which shape humans' understanding of the world and their approach to situations and tasks, what is known as

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[17] Hayles, *Postprint: Books and Becoming Computational* (New York: Columbia University Press, 2021).

'distributed cognition'. Comparable to the way we can analyse literature in the context of its socio-cultural time and space rather than strictly focused on linguistics and form, this concept argues that when thinking about the way cognition works in humans and computers, it is vital to consider how their external environment contributes to their processes. This approach to cognition is also seen in Hubert Dreyfus's understanding of cognitive science, whereby he contends that due to the human's embodied nature, their situatedness within the world influences one's reasoning and understanding. The difference between Dreyfus and Hayles's views, however, is that while Dreyfus sees the computer's abilities as strictly input-output based computation, Hayles believes that the machine's cognitive processes are, like of the human, affected by external forces. Just as a person's physical environment influences the decisions they make, a USB inputted into a computer, for example, impacts the machine's processes as, like the human, it recognises this external part with which it must communicate and which shapes its next actions. Thus, the two share similar cognitive abilities yet are not equal to one another, as the human has more agency and awareness of its decision-making abilities and environment.

Hayles's notion of distributed cognition is not only relevant when looking at how the human and the machine's cognitive functions operate separately, but also how they function in conjunction with one another. In what she calls 'cognitive assemblages', the two agents enter into a conversation in which 'the cognitive decisions of each affect the others', as with each action there is a reaction from the counterpart.[18] This can be visualised by understanding what happens when a user clicks on a hyperlink and is provided with the desired web page. Simplifying the process greatly: the user communicates, the machine interprets and understands what is being communicated through the multiple layers of coding; the machine responds by completing the task. While humans technically engage in cognitive assemblages

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[18] Hayles, *Postprint*, p. 33.

everyday with electronic appliances, interacting with E-Lit is not exactly the same. E-Lit itself may be thought of as an event as it brings together various media and communicative elements which connect to create an overall literary experience. At the centre of this event is the interplay between the multiple layers of the machine and the human, which plays a key role in E-Lit's creation, distribution, and interaction with users.

Materiality in Print Literature

Just as the issue of materiality is central to the technological medium, so it can be viewed from the lens of print culture. As Roger Chartier explains, 'a text does not exist without the medium on which its reading (or hearing) is based, and [cannot] be understood without considering the form in which it reaches its readers'.[19] Contrary to the oral tradition, the practice of writing literature is innately tied to material objects, whether they be a pen and paper, a typewriter, or a computer. The way the work is produced and shared with readers is the second stage of print. Authors and publishers make countless choices on the way the story is presented – the typography, the type and texture of the pages, the soft or hard cover, the size, and the inclusion of illustrations are just a few variables which make a significant impact on the text's overall look and feel. As Bremer says, along with the text's format, 'the quality of the paper and the typography used' are meaningful features of literature's materiality, as they regulate reader behaviour and reception of the text.[20] In his analysis, Bremer also highlights how materiality makes a social statement, what Carlos Spoerhase calls 'materiality in social practices'.[21] For instance, texts printed in octavo format – full sheet papers folded to create eight leaves – became a symbol of wealth when Italian scholar Aldus Manutius popularised it in the early 1500s. In 18th century Europe, due to rising cost of paper, the type of paper a text is bought in

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[19] Roger Chartier, *Lesewelten, Buch und Lektüre in der frühen Neuzeit* (Frankfurt, New York: Campus, 1990).
[20] Bremer, p. 352.
[21] Carlos Spoerhase, *Das Format der Literatur. Praktiken materieller Textualität zwischen 1740 und 1830* (Göttingen: Wallstein, 2018), p. 37.

also sent a message of differing social status for readers. Thus, it is clear that text materiality is an important feature to consider as it 'controls text reception and reading behaviour', Bremer contends.[22] It affects the experience of the reader by impacting their senses. Humans rely on their senses to understand the world, and those who work in the publishing industry recognise the importance of placing as much attention on the physical book itself as on its content. Readers' initial reaction to a book revolves around its material – the way it feels, looks, even smells – and this material experience continues throughout its reading until the very last page.

An example of this longstanding fascination with playing with materiality is Jonathan Safran Foer's 2010 novel, *Tree of Codes*.[23] As the title suggests, the text creates a multitude of layers which need to be drawn out by the reader, both within the fictional world itself through the piecing together of a man's last day alive, and physically through the complex presentation of the work. The novel is based on Bruno Schulz's *The Street of Crocodiles,* as Foer snipped Schulz's text to create his own and displays this process in his own work. Using a die-cut technique, Foer's pages are literally cut to reveal only the words he wants the reader to be exposed to on each page, lending itself nicely to the theme of the novel. The work is both a sculpture in itself and an innovative way of playing around with materiality by pushing readers to rethink how a text can look, feel, and be read.

Another example of print literature which pushes boundaries on the traditional physical features of a book is Raymond Queneau's 1961, *Cent Mille Milliards de Poèmes*.[24] This celebrated combinatorial poetry text is made up of one hundred thousand billion poetic permutations which can only be read by physically altering the lines through the paper snippets. Each page is cut into strips, one line per strip, thus allowing the reader to replace any line with

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[22] Bremer, p. 352.
[23] Safran Foer, *Tree of Codes* (London: Visual Editions, 2010).
[24] Raymond Queneau, *Cent Mille Milliards de Poèmes* (Paris: Gallimard, 1961).

a multitude of others, creating the possibility for a hundred thousand billion poems wrapped up in one book. Given the significant number of possible permutations, it is safe to say that Queneau's text was not created for readers to actually read each and every poem. Based on calculations, if a reader was to attempt this brave task at a rate of one poem per minute, they would still need nearly 200 million years to complete the book. Queneau's work is more focused on providing a different experience with literature for readers, as well as, per the Oulipo style, to go beyond what theorists thought literature could be and do. Playing with the material of the book in this way surprises the reader and forces them to be more aware of the role the physical relationship between them and the book has on the literary experience.

Queneau's masterful work was later transferred onto the machine in 1997.[25] This web version shows a sonnet from Queneau's text on the screen, and is replaced by another of his permutations whenever the user reloads the page. Although this digital version mirrors the concept of Queneau's work – a plurality of poems made up of different combinations of the same lines – the point of the work itself, that is, the experience of the reader/user, is not retained with the 1997 work. The physical role the reader plays in modifying the poem through the pages' snippets is lost in the digital version, as the user must now simply click to refresh the page, a mundane task any person living in the contemporary era would do countless times a day, thus taking away focus from the materiality of the work. The same can be said for traditional literature converted into e-books, as whilst technologies like kindles attempt to reinstate a user's reading experience by digitally recreating the turning of the pages, for instance, the sensorial experience with print cannot be reconstructed with a machine.

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[25] Raymond Queneau, *Cent Mille Milliards de Poèmes* (web version, 1997), Oulipo, Generative, Poetry, Adaptation, <https://elmcip.net/creative-work/cent-mille-milliards-de-poemes-web-version-1997>.

Materiality in E-Lit

The analysis of literature's materiality in relation to how it affects the literary experience is even more complex when viewing it in the context of electronic literature. E-Lit was created in an attempt to venture into new territory for literature, of moving away from traditional print towards a medium which, as proven, offers writers countless new possibilities of creating, sharing, and experiencing the literary. It is why Loss Pequeño Glazier argues that this type of media is seen as a continuation of experimental literature, taken an even further step through new practices and new ways of experiencing the literary.[26] Undeniably, readers already have expectations formed by their deep knowledge of print conventions and literary modes when approaching digital works. Whilst they build on these conventions, they also position themselves differently to their intended audience by modifying and transforming those same principles, thereby disrupting the experiencer's anticipations and offering a unique and memorable experience. We understand new media through our already established understanding of old media, and since the new media adds an extra element, it influences our interpretation of old media as well. This explains how, for instance, we understand the concept of VR (virtual reality), which takes users on a sensory-focused first-person cinematographic experience, after having spent years understanding, watching, and playing video games which also have users playing in the first person (of course depending on the purpose of the game itself) with senses such as sight, sound, and touch being activated through the screen and remote. E-Lit takes already established conventions with print and builds upon them by translating and enhancing the user's material experience through the inclusion of the machine's components and capabilities. Materiality is now instantly distinct to print as the medium itself has changed from print to digital; yet, as many E-Lit scholars including Hayles underline, E-

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[26] Loss Pequeño Glazier, *Digital Poetics: Hypertext, Visual-Kinetic Text and Writing in Programmable Media* (Tuscaloosa: University of Alabama, 2001).

Lit works are not simply traditional literature translated onto the screen as e-books are – they are inherently 'born-digital', thus cannot function without the machine.[27]

Since materiality is such an important feature of E-Lit, there has been much research on how materiality is used in E-Lit works. Bolter and Grusin argue that in both old and new media, there is a tendency to have one of two impulses for materiality which are based on the 'double logic of remediation'.[28] Some works of E-Lit turn to immediacy, which refers to the act of almost hiding the medium for the experiencer. In these cases, the user is presented with what seems like an authentic, realistic experience which they engage with first-hand with no attempt to direct attention to how materiality affects their experience with the work, such as in realistic video games like the first-person shooter game *Call of Duty*. On the other hand, Bolter and Grusin claim that some other E-Lit works call for hypermediacy, which represents works that outwardly highlight the medium for the experiencer. Users of these works are aggressively reminded of the medium and the role it plays with how the work can be engaged with, not only by means of physical objects such as mobile phones with AR (artificial reality) – like in *Clandestine: Anomaly* by Corey King and Dee King – but also through the inclusion of machine code within the work to remind users of the software which also makes part of the medium – as in Mez Breeze's *_[data][h!][bleeding texts*. Interestingly, it is more common to find E-Lit works which use hypermediacy than immediacy. The reason for this may be that because we have not yet become accustomed to the conventions of digital literature, the mechanical medium's role is still very new for users, and thus creators want to ensure that users are aware of how the medium is affecting their literary experience. An alternative reason may be that E-Lit as a type of literature is inherently experimental. Comparable to the avant-garde movement and the postmodernist French group Oulipo, E-Lit may hold a similar approach by which it

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[27] Hayles, 'Electronic Literature: What is it?'.
[28] Bolter and Grusin, *Remediation*.

continuously aims to create unique and surprising experiences, thus never achieving a mimetic state. Whatever the reason, it is clear that E-Lit is always trying to find new and exciting ways of creating brand-new literary experiences, and, at least for the time being, its playfulness with materiality plays a key role towards this goal.

Central to the materiality of E-Lit is the machine; more specifically, the code which acts as its 'mind' without which the computer is merely physical components joined together with no real use. As Hayles argues, there are multiple layers of code behind the screen that contribute to the allowance of the user's experience to a piece.[29] Since all of these layers are necessary in order for a work of E-Lit to be displayed or visualized, and therefore experienced by a user, they form part of the medium and thus play an important role in E-Lit. From the code typed by the human agent to the machine's role in interpreting that code, translating it into machine code, and communicating with other components to make the required changes visible on the screen, each step supports the creation and exhibition of an E-Lit work. These works are therefore reliant on machine readers which derive meaning from the code that is provided to them through machine language, to then present pictures on a screen which can be interpreted by the human agent. This creates an important distinction from print, in that whilst traditional literature is simply what is on the page, E-Lit has a build-up of layers which communicate with one another using different languages, and influence each other with every change. This also brings in Hayles's concept of 'cascading recognition', which refers to the way that at every level of this interaction – also bringing in the fact that users can oftentimes alter the work themselves which causes a stream of communication back down to the work's code then back up again with every alteration – there is a transfer of information between one agent to another which affects all agents, thereby increasing the complexity of the process of E-Lit and its materiality. Undeniably, the physical components of the machine are just as important as the

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[29] Hayles, 'Print is Flat, Code is Deep'.

software itself, as there is depth in hardware as much as there is in software. As Nick Montfort and Noah Wardrip-Fruin explain, the entire system only works due to the communication between the physical components, the software, and the human agent who initiates the digital actions through their interaction with the physical components.[30] There is therefore a cyclical process of communication (Hayles's cognitive assemblages theory) between the three – human, physical machine, software, human, all of which make up the materiality of the digital work.

Outline of the Argument

This dissertation will begin by examining the components which make up the machine's materiality, both the intangible software as well as the physical hardware. It will outline the communicative layers and processes which occur between the two within the machine and in conjunction with the human creator and user, and will provide an analysis of Mez Breeze's codework E-Lit titled *_][ad][Dressed in a Skin Code_,* while highlighting how the themes and form of the work itself bring awareness to these multiple layers of communication. It will then argue that whilst the technological medium allows for more affordances in creating a unique literary experience, its constant evolution presents a challenge to the preservability of works of E-Lit, unlike its predecessor, print.

The second chapter will compare the print and digital mediums for experiencing literature, arguing that whilst the machine provides a more multifaceted experience, readers have gained an emotional connection with the print medium after centuries of associating the printed book with the literary. It will then argue that whilst the two mediums are distinct from each other, several creators have found ways of combining the two to bridge the gap between the familiar and unfamiliar, known as 'skeuomorphism'. This concept will be discussed further

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[30] Nick Montfort and Noah Wardrip-Fruin, 'Acid-Free Bits', *The Electronic Literature Organization*, <https://eliterature.org/pad/afb.html>.

in relation to Amaranth Borsuk and Brad Bouse's book-screen hybrid work titled *Between Page and Screen*, with a focus on the user's relationship with the two mediums.

The third chapter will focus on E-Lit that engages the user by embodying the work corporeally. This user-centred literary experience utilises technological affordances by encouraging users to perform physical actions in order to reveal and experience the work. Mostly seen in locative narratives, these works immerse users in a unique and corporeal way, providing a space for them to interact with the literary text, the machine, and their own spatio-temporal environment using their physical bodies, while also deliberating the extent to which interactors of these works have agency over their own bodies and actions. Here, the locative narrative *34 North 118 West* by Jeff Knowlton, Naomi Spellman, and Jeremy Hight will be discussed in further detail.

The dissertation will conclude by assessing how terms such as 'literature' and the 'literary' are applicable to literature in the digital age, by considering varying definitions of the two and how they are understood within the context of the institution of literature and of E-Lit. It will investigate the relevance of the 'post-literary' to this topic by asking whether the literary today is not only found in literature but also in other art forms. It will then review the central role which materiality has in these questions by arguing that, as seen throughout this dissertation, materiality has a profound influence on the way that we experience literature (both traditionally but even more so digitally), and on the relationship between the human, the machine, and literature.

Chapter One – The Machine as Medium: A Layered Manifold of Code and Machine

The Materiality of Software

The machine itself is undeniably an integral part of E-Lit since it is, after all, 'digital-born' literature. It contains countless layers of hardware components and software which act as the medium through which E-Lit is created and experienced. Focusing on the software, the computer reads alongside the human readers as it interprets and translates the hundreds of lines of code behind the screen. The layering of coding from human code to the machine's code to whatever is projected on a screen shows that the way in which one reads, interprets, and understands E-Lit can be mirrored with the machine's process, as both contain a multitude of layers which must be seen through to reach the final result.

As Hayles's theory on distributed cognition details, the human and non-human agents collaborate to write and execute works of E-Lit. This is clear when viewing more closely the way that any piece of code is created and run. The process begins with the human agent writing code in either a high-level programming language, such as Java or C++ which are closest to the syntax humans know and understand, or low-level languages which are closer to machine language.[1] Focusing attention on high-level languages, since those are the most popular ones especially for novice coders, there are then two ways the next step can proceed depending on which language is used. Programming languages like Python or Ruby require an interpreter to read the source code line by line and execute it directly, thus not needing to convert to machine code. On the other hand, languages such as Java and C# are known as compiled languages, as the program needs to compile and translate the human code into machine code (a combination

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[1] One cannot ignore the potential effects which Artificial Intelligence (AI) might have on this process in the future. However, it should not be forgotten that AI itself is initially scripted by human agents, thus the human's role should not be entirely disregarded.

of 1s and 0s which are grouped into 8-bit sequences known as bytes) for the computer to understand and project the requested visuals on the screen. Once a change in code is made by the writer in either interpreted or compiled languages, the program must run the whole code again for the change to be implemented. This is where Hayles's theory on cascading recognition is relevant, as due to the multiple layers of coding and translating, each change made by either the human or the machine leads to a cascade of interactions for both agents. Applying this to E-Lit, it is clear that E-Lit's materiality involves a complexity which is not seen to the same extent in traditional literature, and which only increases its multifaceted trait when the work overtly attempts to highlight this process to the experiencer.

Mainly seen in works which Alan Sondheim coins 'codework', some E-Lit outwardly underlines code's involvement in the process of its creation and projection by displaying elements of code within the text itself.[2] Since, as Hayles argues, 'code must be considered as much a part of the "text" of electronic literature as the screenic surface', texts which are considered codework seek to remind the user that the code and its execution using the software and hardware of the computer are at the centre of the literary experience.[3] Codework is therefore a 'text-object or a text-event that emphasises its own programming, mechanism, and materiality', according to Raley.[4] It makes the user aware of the layering of coding and the multiplicity of languages which are all required for the work to be exposed to experiencers, thus highlighting the collaboration between hardware, software, and user for E-Lit to be produced and experienced. Moreover, codework language itself varies depending on the author. From Mez Breeze's 'm[ez]ang.elle' in *data][h!][bleeding texts*[5] to Talan Memmott's

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[2] Talan Memmott, 'Codework', American Book Review, 22.6 (2001), <https://elmcip.net/research-collection/codework>.
[3] Hayles, *Electronic Literature: New Horizons for the Literary*, p. 35.
[4] Rita Raley, 'Interferences: [Net.Writing] and the Practice of Codework', *Electronic Book Review*, (2002), 1–22 <http://electronicbookreview.com/essay/interferences-net-writing-and-the-practice-of-codework/>, p. 1.
[5] Mez Breeze, *data][h!][bleeding texts* (2001), Codework, Flash, <http://netwurkerz.de/mez/datableed/complete/index.htm>.

'rich.lit' in *Lexia to Perplexia*,[6] each codework writer utilises the same idea of mangling common English language with machine language elements and neologisms to create a fragmented and unfamiliar reading experience while keeping at the forefront the machine's materiality.

This same disruptive literary experience is seen with works which draw attention to not just the layers of coding themselves, but coding's role in the process of producing works of E-Lit. These works subvert readers' assumptions when approaching a work of literature after years of traditional literary conventions by shining as much of a light on literature's form as on its content, whereas traditional literature first and foremost focuses readers' attention on the story within. This is seen in Nick Montfort's collection of poems in *#! [Shebang]*.[7] In his work, *Round*, the textual output presents a collection of verses with combinations of the words '/n', 'in', 'crease', 'form', 'tends', 'tense', 'to', 'tone', 'vent', 'verse', as seen in the work's code which is shown alongside it.[8] Whilst the individual words of the text itself are understandable by readers, the seemingly random combination of them in verses does not create coherent sentences. This is due to the fact that the program is set to run the infinite number of mathematical constant π (pi) and each number between 0 and 9 has been assigned a word, thus outputting a potentially infinite number of verses with the same 10 words put together. As Mario Aquilina claims, Montfort's poems are therefore both a 'product *of* computation' and are '*about* computation' as they draw attention to their relationship with the literary and language.[9] Montfort's work is defined as 'computational' by John Cayley not simply because

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[6] Talan Memmott, *Lexia to Perplexia* (2000), Textuality, Network Phenomenology, <https://elmcip.net/creative-work/lexia-perplexia>.

[7] Nick Montfort, *#! [Shebang]* (2014), Conceptual Writing, Computer Generated Poetry, <https://elmcip.net/creative-work/shebang>.

[8] Montfort, *#!*, p. 2.

[9] Mario Aquilina, 'The Computational Sublime in Nick Montfort's 'Round' and 'All the Names of God'', *CounterText,* 1.3 (2015), 348–365.

it is run on a computer, but due to its algorithmic quality.[10] With the running of the code, the work appears almost on its own, with no human interactivity once the program begins to run. The machine's production of the text is therefore a significant part of the work in itself, which is not just the text, but the way it is processed and presented.

This formalist viewpoint is relevant to not only Montfort's works, but to all E-Lit which draws attention to itself rather than to the outside world. Unlike works which primarily focus on social commentary to urge users to view the world differently and enact positive change, these works highlight how their form affects users' experience with the literary; in other words, they call attention to their own materiality and their relation with the user's materiality. To a certain extent, this drawing attention to a work's own materiality is not new in literature. Several postmodern works are self-reflexive in the sense that they frequently remind the reader that they are reading a work of literary fiction through a printed book. For instance, in the opening page of *If on a Winter's Night a Traveller*, Italo Calvino writes: 'You are about to begin reading Italo Calvino's new novel, *If on a winter's night a traveller* … Find the most comfortable position: seated, stretched out, curled up, or lying flat … With the book upside down, naturally'.[11] From the very beginning of the novel till its end, the reader is constantly made aware of their physical space while holding and reading this book, as well as of the fact that they are reading this specific fictional text. This effect is comparable to that experienced with the works of Mez, Memmott, and Montfort, as the user is repeatedly reminded of the digital medium through which the work was created, distributed, and, apart from in Montfort's case, experienced, thus looking inward rather than outward towards society as other works of E-Lit and traditional print do.

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[10] John Cayley, 'Poetry and Stuff: A Review of #!', *Electronic Book Review,* (2015), <http://www.electronicbookreview.com/thread/electropoetics/shebang>.
[11] Italo Calvino, *If on a Winter's Night a Traveller*, trans. by William Weaver (London: Vintage Books, 1998 [1980]), p. 3.

Similar to Montfort's generative works, the Oulipo's combinatorial works were literarily unique not so much as texts themselves, but through the way they were created using playful constraint-driven techniques. Just as Marjorie Perloff argues that this aspect of the Oulipo's literature is 'not only a rule but a thematic property of the poem',[12] Aquilina claims that computation in Montfort's works is not merely the tool which provides the textual output, but is also thematically significant in what he calls the 'computational sublime',[13] by which he refers to the feeling one gets when experiencing generative E-Lit which creates an almost limitless series of computations from a limited number of elements. As Immanuel Kant says, this feeling of sublimity makes 'everything else [seem] small', providing the reader with an almost paralysing feeling from its grandeur.[14] In combinatorial works like Montfort's, the literary experience is tied to their materiality, that is, to the way the machine interprets, translates, and presents the code in a way that is computational and which process can only be done by the machine. Having said this, it is significant to note Montfort's work *All the Names of God*, also found in *#!*.[15] This work produces a theoretically infinite number of lettered combinations separated by underscores, starting from one letter to two to three and so on, meaning that no computer can possibly withstand the amount of data outputted, so it will eventually crash. Here, along with the thematic tie with infinity through the religious belief that God is everything, one may also comment on the fact that despite the seemingly infinite knowledge and tools which the machine provides humans through the World Wide Web, the whole list of Montfort's work always inevitably exceeds the computer's limitations.

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[12] Marjorie Perloff, 'The Oulipo Factor: The Procedural Poetics of Christian Bök and Caroline Bergvall', *Textual Practice,* 18.1 (2004), 23–45, p. 25.

[13] Aquilina, 'The Computational Sublime'.

[14] Immanuel Kant, *Critique of Judgment*, trans. J. H. Bernard, Mineola (NY: Dover Publications, (2005 [1790])).

[15] Montfort, *#!*.

Materiality in Mez's Codework

While computational limitations exist and can hinder the user's experience with E-Lit works, the machine nevertheless undeniably provides some 'resources for artistic creation', in Hayles's words, which traditional print may not offer.[16] The literary work *_][ad][Dressed in a Skin Code_* by Australian writer and artist Mez Breeze draws attention to the computer's unique capabilities which can enhance an E-Lit work.[17] The 2002 text uses a combination of codework and various design elements, some of which are interactive, to create a work which transcribes a series of 'ho.][email][list.ically documents' which were written during the creation and evolution of Mez's codework language known as 'm[ez]ang.elle' between 1995 and 2001.[18]

The way that code is utilised in this work is notable, as the coding languages and tools used communicate with one another to show the final result. The work was coded with HTML (HyperText Markup Language) which is standardly used to build and structure websites, and which is an interpreted language, meaning that lines of code are understood and executed by the machine without requiring translation into binary. Within the source code, Mez also utilises JavaScript, a well-known programming language which is used to add functions not available with HTML, and which enhances the user experience. While JavaScript used to be an interpreted language, which means that the computer needed to execute the source code directly without translating it into machine code, with today's advanced browsers, it is now known as a just-in-time (JIT) compiled language. This refers to how the source code is translated into what is called bytecode, then translated into binary (machine code) each time a program is executed. Therefore, in order for the computer to run the work, it needs to interpret and execute

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[16] N. Katherine Hayles, 'Deeper Into The Machine: The Future of Electronic Literature', *Culture Machine,* 5 (2003), <https://culturemachine.net/the-e-issue/deeper-into-the-machine/>.

[17] Mez Breeze, *_][ad][Dressed in a Skin C.ode_* (2002), Codework, Distributed Cognition, <https://elmcip.net/creative-work/addressed-skin-code>.

[18] Breeze, *_][ad][Dressed in a Skin C.ode_*, <https://www.cddc.vt.edu/host/netwurker/>.

the HTML lines while doubly translating and executing the JavaScript lines, whilst the two languages collaborate and communicate with each other to ensure certain functions work as intended. Even the server itself is written in codework; Mez uploaded the work to a server she named 'net.wurk'. A 'network' refers to the relationship between two or more computers to share information, thus the name of the server itself implies the recurring idea of a symbiotic collaboration between agents.

From the front-end, it is clear that this layering of communication between languages is mirrored in the textual output as well. Mez's celebrated codework language 'm[ez]ang.elle' was created by mangling the English language with machine language. This not only creates a truly unfamiliar reading experience which defamiliarises users from the traditional way of reading literature, but also serves as a constant reminder of the text's computational materiality and the materiality of language itself. Thematically, the text documents the evolution of m[ez]ang.elle from 1995-2001 through a series of texts which mirror the structure and form of e-mails, Mez explains in the foreword to her work. She tells users that 'the texts presented here act as residual traces from net.wurk practices that thrive, react N shift according 2 fluctuations in the online environment in which they][initially][gestated'.[19] Throughout the work, Mez takes portions of network communicative exchanges and mangles them with machine language elements, 'by making widespread use of brackets and periods to split words (somewhat hypertextually) into multiple component parts'.[20] In the section titled '_Tracking a Net.Wurk O(r)bit_ (+trajectory translation)', Mez highlights the use of coding embedded in her language through enlarged, differently-coloured, and frequent use of square brackets, which are a staple feature in coding languages like JavaScript to open and close off a string (where data is placed).[21] Yet, what is interesting is the repetition of '][', which seems to be inserted both as a

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[19] Breeze, _][ad][Dressed in a Skin C.ode_.
[20] Raley, 'Interferences', p. 8.
[21] Breeze, _][ad][Dressed in a Skin C.ode_, <https://www.cddc.vt.edu/host/netwurker/netorbit.html>.

tie to the work's code and as an added visual feature which draws users' attention, as seen in Figure 1. The figure is also seen doubly after clicking the first hyperlink on the main page, as seen in Figure 2, and frequently throughout the entire work itself. The text in the previously named section narrates an introspective telling from Mez's viewpoint of her feelings towards the making of her coded language and E-Lit works, and further down the same page, Mez provides users with a translation of the text in standard English. The inclusion of this translation underlines the idea that the significance of codework is in what it does and how it does it rather than the meaning of the words themselves. It is therefore clear that this work is all about communication, both in its materiality and thematically. From the communicative relationship of coding languages that support the running of the work, to the use of codework and thematic tie to emails (which are means of communication), Mez highlights to users that communication is both unceasing and inevitable, be it human with human, human with machine, or machine with machine. There is therefore a link between the theme of the work and its formal thread. The way the work is presented from a formalist perspective, that is, the use of codework language, hyperlinks, and visuals, is combined with what the work is trying to do, that is, bring attention to the incorporeal materiality of the machine. All of these different digital elements merge to create a work which is both interactive and engaging for the user and aesthetically valuable.
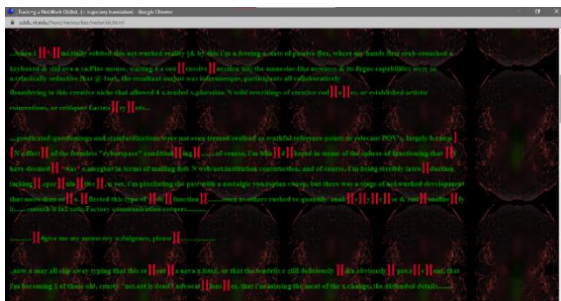

Figure 1

Figure 2

However, the user's experience with Mez's work does not only revolve around the textual output. Many E-Lit texts add a layer of experience by stimulating various senses during the experience, such as sight, sound, and touch. As Hayles argues, E-Lit 'takes advantage of the capabilities and contexts provided by the stand-alone or networked computer', and many E-Lit authors prove this to be true through their multimodal approach.[22] While multimodality such as integrating images has been used in traditional print literature, such as in William Blake's collection of illustrated poems *Songs of Innocence and of Experience*, the machine allows for a greater shift in focus on the visual sense through the use of moving pictures, interactivity with pictures and words, and more lifelike experiences through virtual and augmented reality, to name a few. Authors such as Deena Larsen and Mez herself utilise their works to blend the lines between digital art and digital literature. In fact, Cayley argues for the term 'digital language art' to refer to electronic literature like Mez's due to their innate graphic features, and such works are thought to be part of an online movement known as net.art which covers a wide range of digital art practices.[23]

In Mez's work, the visual elements are undeniably significant. The textual output and visuals such as static images, images which change once the mouse hovers over them, moving pictures, and other design features are meticulously placed in each section of the work to complete the curated experience. While some images within the work are linked to a site, others are taken from the source computer which were uploaded to the server along with the code. This means that the machine must connect with both the server which holds the code and some multimedia elements as well as with the internet itself to access images or moving pictures linked to other sites. In the work itself, where the multimedia elements come from does not impact the way it is seen by users; however, they can be identified through the code in the

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[22] Hayles, 'Electronic Literature: What is it?', p. 3 <https://eliterature.org/pad/elp.html>.
[23] John Cayley, *Grammalepsy: Essays on Digital Language Art* (New York: Bloomsbury, 2018).

'Sources' section; Figure 3 shows an image being taken from the server ('host/netwurker'), while Figure 4 shows an image being taken from a Wikipedia page. Moreover, sound is also an important element in this text. In the work's preface, Mez tells users that 'sound is [more than] relevant so please use yr volume dial accordingly'.[24] Stimulating the user's sense of hearing adds yet another layer of experience and another task for the computer to enact. However, when attempting to experience the work in 2023, no sound can be heard, thereby losing a central part of the work's multimedia and highlighting a problem with the digital medium's continuous evolution. After inspecting the code to ensure that there is some kind of audio tag, in the hyperlink '_userperv_', for example, there is evidence of multimedia tools which should allow audio to be heard.[25] Figure 5 highlights a snippet of this code which displays the use of Adobe Shockwave (a type of Flash Player used to run multimedia including audio and visuals) which is no longer supported on today's computers. Some multimedia still run due to Flash now being incorporated into today's browsers – which is why the images can still be seen – however, other media types such as sound and most moving pictures (gifs) can no longer be experienced unless the source code is updated. The codework, visuals, and aural features thus are intended to integrate and collaborate both in terms of providing users with a unique literary experience, as well as from the viewpoint of the machine in the multiplicity of commands which it must run simultaneously.

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[24] Breeze, _][ad][Dressed in a Skin C.ode_.
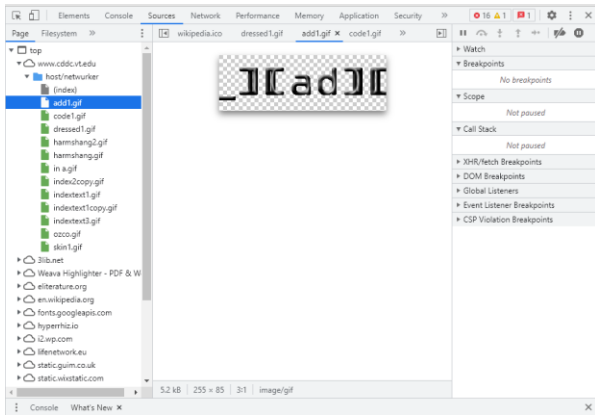[25] Breeze, _][ad][Dressed in a Skin C.ode_, <https://www.cddc.vt.edu/host/netwurker/userperv.html>.
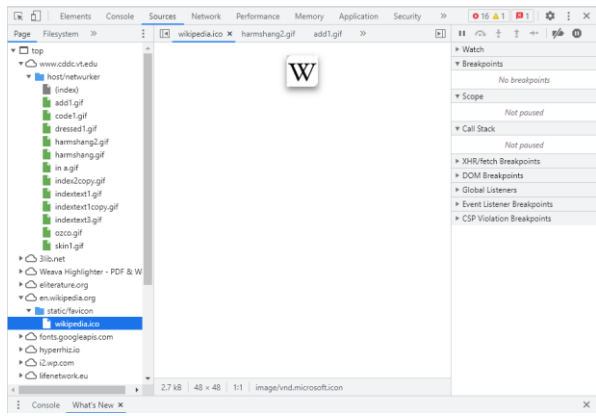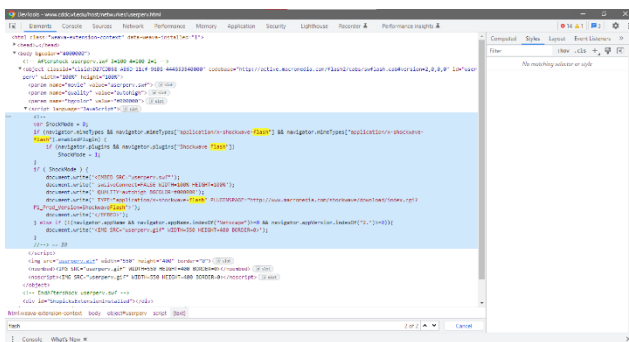
Figure 3

Figure 4

Figure 5

The machine is therefore the primary agent of the work's materiality, yet the human is also involved to an extent. Of course, the work would not have been created without Mez's imagination and coordination alongside collaborators, and the work would not have the medium through which it is run and shown had there not been humans to create the computer – software, hardware, and anything in between. The experiencer themselves also play an important role in, one may argue, any literary text or work. After all, literature, like any other form of art, is not made to simply be, but to be experienced, recognised, interpreted. From the preface of the work, Mez makes clear that the user is an important and valuable piece of the puzzle. She explains that 'the _n.hanced_ wurks contain various n.teractive elements that require u [the user] to x.plore & x.tract meaning via mouseovers, clickable regions, audio fragments & x.tended "click-N-hold" areas'.[26] Given that the work cannot be displayed without

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[26] Breeze, *_][ad][Dressed in a Skin C.ode_*.

the user's engagement, and that interaction plays a big role in this text, the user also contributes to its materiality. It is important, Mez says, to 'be rigorous & patient during yr x.plorations', implying that the work is extensive and needs to be experienced in its entirety, which can only be done through the user's intense interactivity with the work.[27]

At a more micro level, one can argue that both the author and user are deeply involved in the production and interpretation of the work through language. Just as there are multiple layers of language translation and communication occurring in and by the machine, there are additional layers when considering that similar processes are happening between author and machine, and between machine and user. Since the program was coded with HTML and Javascript, the source code is very similar to standard English; but of course, it is still a completely different language in terms of the specific ways the commands need to be written for the machine to be able to interpret and execute. The source code therefore creates an initial link of communication between the creator of the work and the machine which is understandable by both agents, and which is then translated to machine-only code then to what is displayed on the screen (in a simplistic explanation of events). The user is then only shown the codework which Mez wants them to view, not all of the layers behind the screen, but the codework itself draws attention to these layers by including elements which would typically not be presented to users but found within the source code or machine code. Given the fragmented nature of codework as it is essentially built from several different languages at once, users attempt to translate the work into something understandable for them – standard English – in order to be able to interpret it fully.[28] However, the point of codework is not to understand each specific word, but to retrieve meaning from what it does and how it does it. Nevertheless, it is clear that human involvement is essential in the materiality of the work due

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[27] Breeze, _][ad][Dressed in a Skin C.ode_.
[28] For the purpose of this dissertation, the use of other languages by worldwide users and the implications of additional layers translation of that sort presents will not be discussed.

to the levels of communication between the human and the machine. Undeniably, Hayles's theory of distributed cognition comes to mind here. Even after the writer finishes and executes the work, they can make amendments to the source code (known as making patches in the coding community) which generates further communication with the various levels of the machine. Moreover, since the user is free to interact with the work non-linearly, the changes on the screen which occur when pressing a hyperlink or hovering over a changing image are enacted only through the cascading process of information travelling from the user through the machine and back up to the user through the screen, thereby again extending the communicative relationship between the two agents.

The Materiality of Hardware

The communicative journey of E-Lit is not only extended through the 'brains' of the computer – its software – but also through its hardware. There are two levels to this aspect of the computer's materiality: how the software and hardware interact, and how humans and hardware interact. Both are critical to the computer's usage overall, as well as to the processes of creating and experiencing E-Lit.

As Hayles claims, 'hardware and software act not merely as vehicles to deliver text but rather enter consequentially and dynamically into the production of the text as such'.[29] The interaction and communication with one another is therefore integral to the system and to E-Lit's materiality. The communicative process begins with the processing chip (known as the CPU or Central Processing Unit), which is found within every computer and is made up of semiconductors which transmit electronic data signals. Found within these chips are several tiny components including transistors. The role of transistors is to receive the electrical signals sent by the binary input (machine code which communicates through a series of 1s and 0s based

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[29] Hayles, 'Deeper into the Machine'.

on the computer's translation of the source code) and connect to logic gates which perform the desired command. The logic gates are opened with every '1' and closed with every '0', and it is this specific combination of opening and closing which allows the computer to know what the user wants it to do and thereby execute it onto the screen.

From the user's perspective, hardware is crucial as it is the vessel through which users see and hear what the computer is allowing them to through the layered material screen and speakers. It also provides users access to communication with the computer, to let it know what actions they want it to perform. This is done through the keyboard and touchpad, both of which are connected to the motherboard (where the CPU and other components are held) through USB cables; not to mention, of course, all of the other cogs which go into the physical structure of a laptop, computer, mobile, and other electronic devices. The hardware therefore acts as an intermediary here, a collection of physical components which serve as a link between human and machine. Yet, hardware's significance should in no way be diminished as simply an intermediary. Following Friedrich Kittler's argumentation in his book *Literature, Media, Information Systems*,[30] Irina Kaldrack and Martina Leeker argue that there is no software without hardware, 'because the technical operations occurring within the computers could be reduced to switches in the hardware, which are then merely made human readable by the software'.[31]

The above is of course applicable to all works of E-Lit which use the computer as the medium, but some works require less or more interactivity between the user and hardware than other works. For instance, in Nick Montfort's *Taroko Gorge*, the user plays the role of a passive spectator as the work automatically rolls through – the term 'passive' here referring to the lack

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[30] Friedrich Kittler, *Literature, Media, Information Systems* (Oxfordshire: Routledge, 1992).
[31] *There is no Software, there are just Services*, ed. by Irina Kaldrack and Martina Leeker (Germany: Meson Press, 2015), p. 11 <https://meson.press/wp-content/uploads/2015/06/9783957960566-No-Software-just-Services.pdf>.

of physical involvement from the user.[32] In this case, the user can, though, interact more deeply with the work should they choose to do so by taking the source code which Montfort provides and remixing the work to create their own, as several others have done and continue to do. In Mez's _][ad][Dressed in a Skin C.ode_, the user has to and is encouraged to explore the work patiently and in depth. From the clicking of hyperlinks to the hovering over changing visuals, the user interacts with the work not only through the investigation of the net.wurked textual output, but through the clicking and scrolling to discover new sections and experiences. Despite the necessity to interact with the hardware, however, the work itself does not draw attention to this aspect of its materiality. The hardware elements are used to execute and experience the work; users are not invited to stop and ponder on the physical screen that is projecting the work or the mousepad used to scroll through it. Mez therefore draws the users' attention to the codework feature and the layers of code, but not the hardware which connects the user to those layers, thus overlooking an important part of the communicative journey from human to machine and back, over and over again.

This underlining of the software over the hardware provokes a philosophical doctrine known as the mind-body dualism, typically associated with Western philosopher René Descartes.[33] He argues that while the mind and body are made of different substances and one is defined as thinking while the other unthinking, they deeply and unceasingly influence one another. In relation to today's technology, one may think of the components of the machine in a similar matter; the software may be compared to the human's mind while the hardware to the body. Similar to the human's processes, the software and hardware are of different materials but are in constant communication as one's behaviour affects the other. Of course, this watered-down explanation does not consider the fact that the process of communication within the

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[32] Nick Montfort, *Taroko Gorge* (2009), Poetry Generator, Text Generator, HTML, Javascript, <https://elmcip.net/creative-work/taroko-gorge>.

[33] René Descartes, *Principles of Philosophy* (Virginia: SMK Books, 2009 [1644]).

machine is different to that of the human, and that the human mind does not strictly interpret

information computationally as does the machine's software, but also takes into account its

own awareness of its situations and environment. It is interesting to note, however, that in both

cases, the scales are imbalanced. According to Plato and Aristotle, two key philosophers in

Western history, the mind is superior over the body as the latter is thought to be tied to

emotions, rather than reason which is related to the mind, which, they believed, was the key to

happiness. This unbalanced duality has led to several societal biases, such as the ideology that

men are more reasonable and therefore more fit to be in positions of power whilst women are

more emotional due to their bodily abilities of childbearing, for example. Thus, being the

'mind' of the machine, the software is often given more importance over the hardware with

which the user corporeally engages. This is shown in works such as Mez's and Montfort's, as

the two shine a light on the machine's intangible materiality while consequently suppressing

its physical components.

Occasionally, there are some works which overtly remind the user of the hardware they

are physically interacting with rather than their device's software, ensuring that users are aware

that they are using an electronic tool to experience the literary work. In Megan Heyward's

Notes for Walking,[34] users are provided with thirteen short video clips which correlate with

specific locations around the Middle Head National Park in Australia, which urge walkers to

'contemplate notions of waiting, time, and impermanence as they walk'.[35] While the work

offers an added layer to the experience of taking in the park's gorgeous landscape, it is ironic

that the work is essentially pulling users' attention away from the natural environment to view

their mobile devices in order to experience the literary. However, one may also argue that by

evoking further considerations on the walkers' natural environment, they are amplifying their

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[34] Megan Heyward, *Notes for Walking* (2013), Locative Media, Locative Narrative, Mobile,
<https://elmcip.net/creative-work/notes-walking>.
[35] Heyward, *Notes for Walking*.

experience. Most traditional literature has a similar effect on readers. It often encourages us to divert our attention away from society and our everyday lives towards a fictional story, yet does so in order to impart some thought-provoking considerations on the socio-political state of our society, in an attempt to incite positive change. So, just like when reading a book in a park and ignoring nature, to then look at it in a different light, Heyward's work urges visitors to look away from their natural environment only to reflect on it in a more multifaceted way.

Overall, whether there is an attempt to hide or draw attention to the physical materiality of a work, it is a feature of E-Lit which cannot be foregone. Whether using a laptop, computer, mobile phone, VR headset, or installation screen and projectors, authors and users are tied to the inclusion of hardware to be able to produce, share, and experience E-Lit. Even with VR E-Lit such as Caitlin Fisher's *Cardamom of the Dead*, despite the user becoming sensorily immersed in this other world, they are still required to wear a weighty VR headset and hold controllers in each hand, having a constant physical reminder that they are corporeally still grounded in their present space and time.[36]

Traditional print literature is no different though, since the physical book is integral to the literary experience as it is the medium through which readers experience literature both visually and tactilely. It is interesting, however, to see the progression of books compared to technology. Excluding new features brought about by the printing industry, the basic materials of books – paper stocks – have stayed the same for centuries and will most likely remain as is. Technology, on the other hand, is constantly changing, with new products and programs being introduced to society every year. As a result, several creators have combined the two to create a unique experience which utilises the physical medium of the book with the affordances of digital literature. The utilisation of augmented reality through print is one example where the

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[36] Caitlin Fisher, *Cardamom of the Dead* (2014), Virtual Reality, AR, Narrative Environment, <https://elmcip.net/creative-work/cardamom-dead>.

two mediums combine, however, as is seen through Montfort's *#! [Shebang]*, the technological add-ons need not be within the book itself. As explained, his collection of 'digital' poems can be through the printed book, but their intended effect can only be experienced when considering how a poem's code can (or in his case, cannot) be run through the machine. This highlights the issue with analysing E-Lit strictly through a formalist lens, as whilst the work is distributed to and engaged with readers through the printed medium, the work itself must be interpreted through a digital context in order for its literariness to shine. While technological progression has therefore allowed users to experience the literary in new and exciting ways, there is an undeniable downside to this constant updating: non-preservability.

The Limitations of the Machine as Material

Due to tech's constant development, certain E-Lit works cannot keep up with the new changes in hardware and software, and therefore become lost. It is undeniable that everything must evolve, but with digital technology, the rate of advancement in technological progression has been and will continue to be quite rapid. Various operating systems from Microsoft to Windows are constantly being updated and consequently require software and hardware to be updated as well in order for them to remain usable. As a result of this, E-Lit works are unfortunately quickly becoming obsolete due to the system and application software types becoming incompatible with new and so-called improved operating systems. This result often comes along due to programs being discontinued by the companies that provide them, typically in an effort to urge users to use and popularise their newly released programs in pursuit of financial gain. Unlike print literature which can, for the most part, be easily transferred onto the computer through typing or scanning of pages, due to E-Lit's use of multimedia and its use of specific features of the program it was created on, it cannot always be replicated onto new programs. If it can be, it often does not perform in the same way it was initially programmed to, thus it would not be able to continue offering the same literary experience to new or returning users.

The programming languages used by E-Lit authors is also a concern in this sense, as they evolve quite rapidly. Thus, although authors can choose to use interpreted languages which can run on multiple platforms or operating systems, there is still the possibility that their work will not be able to run on the newest software or hardware. Adobe Flash Player, for example, is a discontinued plugin which allowed for the inclusion of design and animation on various browsers and platforms, but was broken off in December 2020. The markup language standardly used for web pages nowadays – HTML 5 – made the plugin obsolete as it included the same facilities without the need to install an additional program. Yet, video games and E-Lit works which were coded using Flash either had to be updated, or their visual features were no longer supported by new software. The same can also be said for outdated hardware such as floppy disks, CD-ROMs, or tape drives.

When investigating Mez's _][ad][Dressed in a Skin C.ode_ in this light, although the work is still available for users to experience today since its launch in 2002, it cannot be fully experienced as was intended, presumably due to the use of Flash and other outdated programs from its release. Although Mez explicitly states that the aural feature of this work is very important, no audio can be heard on any of the webpages despite there being evidence in the code that there should be sound, thereby suggesting that the feature is no longer available as a result of Flash's non-compatibility. There is also proof within the code that several design elements should be moving pictures, yet remain static, which can be attributed to the same reason. Moreover, some sections of the work are inaccessible, perhaps since the code itself is quite old according to coding standards, thus resulting in errors. Figures 6 and 7 show how the section 'reAD' does not load on the browsers Google Chrome and Microsoft Edge respectively. This loss results in the user not being able to experience a whole section of the work, which, based on the code (Figure 8), proves there should be text and images. The user has therefore

lost interactive and sensory components to the work which are integral to the user's interaction
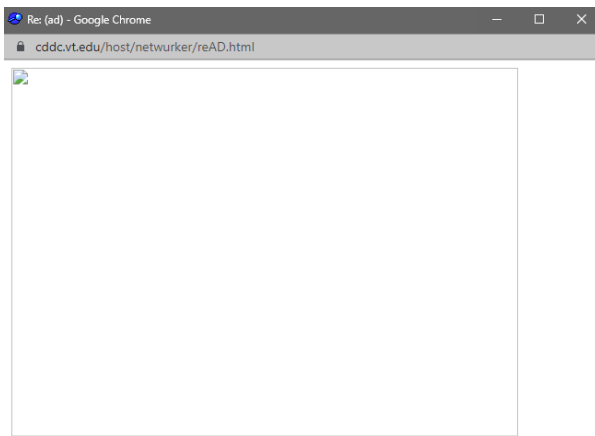
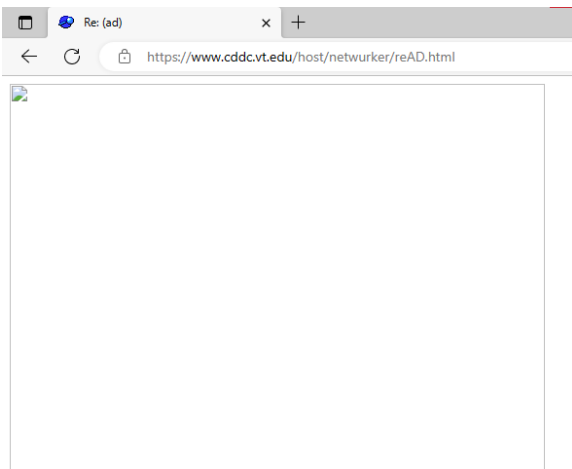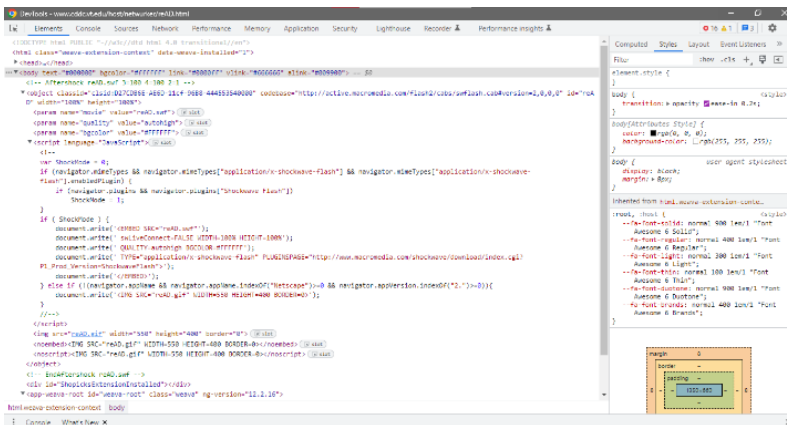with and interpreting of the piece.

Figure 6

Figure 7

Figure 8

Another example of this losing of E-Lit due to issues of materiality is through the work

Califia by M.D. Coverley.[37] This 2000 hypertext fictional piece allowed users to explore and

interact with the multimodal world built inside a CD-ROM, as seen in Figures 9 and 10. Since,

according to the author, the work 'can no longer be played on most Windows computers' due

to software and hardware advances,[38] Coverley took selected episodes from the original work

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[37] Marjorie Coverley Luesebrink, *Califia* (2000), Fiction, Multimedia, Hypertext, Multimodal,
<https://elmcip.net/creative-work/califia>.
[38] Coverley, *Califia Reimagined* (2013), Califia Traversal, Multi-Voiced, Hypertext, Archival Version,
<http://califia.us/califiareimagined/califiare1.html>.

to create *Califia Reimagined* in 2013.[39] This re-imagined piece can now be experienced in an original way on contemporary digital devices. However, the animations have not been preserved, thus a central visual element is lost for users. Yet fortunately, some of the aural elements which were key to the work's experience were recovered and are slotted into each web page.
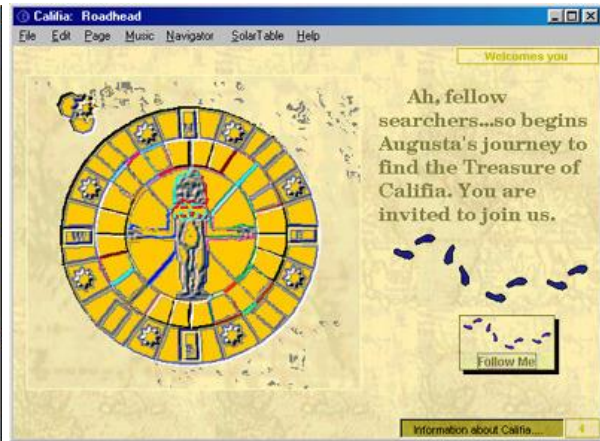

Figure 9

Figure 10

It is ironic, therefore, that though the machine has brought with it countless exciting new possibilities for literature, and though it provides more accessibility to E-Lit works, E-Lit may not be as durable as one might think as a result of the issue of non-compatibility. While the material of books is more fragile than that of the machine which leaves it more vulnerable to damages, and is sometimes not easily accessible without the use of the computer to provide e-book versions, there are a number of books which have survived for centuries and are continually being preserved in libraries and museums. Similarly, several electronic literature writers and groups have been pushing to preserve E-Lit works in any way they can in order to avoid losing valuable pieces of born digital literature, especially from the early years of E-Lit. The Electronic Literature Lab have published four volumes of works titled *Rebooting*

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[39] Coverley, *Califia Reimagined*.

Electronic Literature,[40] which include overviews and critical essays on E-Lit works which were published on 'floppy disks, CD-ROMs, and other media formats' no longer accessible to the average user, as well as grouped live stream traversals of these works so that those interested can at least experience the pieces through a 3rd person.[41] The Electronic Literature Organization (ELO) also play their part in the preservation of born digital art through the committee for the Preservation, Archiving, and Dissemination of electronic literature (PAD), which is commissioned by Nick Montfort and Noah Wardrip-Fruin. The two published *Acid-Free Bits*, a document which outlines this problem and provides authors, academics, librarians, students, and researchers with proactive solutions for E-Lit preservation which the organisation itself is also applying.[42] The section titled 'Principles for Creating Long-Lasting Work' advises creators of ways to safeguard their works from ending up completely inaccessible in the future, such as using open systems rather than closed, preferring plain-text code formats instead of binary formats, retaining source files, and keeping copies of the original work on different media. It is therefore clear that while machinal materiality undoubtedly provides many benefits to authors to create multimodal and unconventional literary experiences, it is that same materiality that can lead to E-Lit's downfall, as exceptional works can quickly become inaccessible to users thereby risking the loss of potentially great works of literature. It is also true that the use of the computer in this way highlights the collaborative and communicative relationship which the human and machine (both through its software and hardware components) share.

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[40] Kathleen Zoller and Aidan Walker, *Rebooting Electronic Literature: Documenting Pre-Web Born Digital Media Volume 4,* Electronic Literature Lab (2021), <https://elmcip.net/critical-writing/rebooting-electronic-literature-documenting-pre-web-born-digital-media-volume-4>.
[41] Zoller and Walker, *Rebooting Electronic Literature*.
[42] Nick Montfort and Noah Wardrip-Fruin, 'Acid-Free Bits'.

Chapter Two – Familiarity in Medium from Print to the Machine

Between the Materialities of Print and the Machine

As is the case with print literature, the materiality of electronic literature affects the experience and relationship that readers have with literature. Despite both providing a literary experience to readers, the way they do so and how that affects the literary experience they offer are fundamentally different. The first and most central difference is that E-Lit is digital-born whilst print does not depend on digital technologies. Electronic literature is produced, distributed, and engaged with through the numerous layers of software and hardware elements within the machine, which, along with the creator and user, communicate and collaborate to provide a unique literary experience. Print literature is more standardised. It does go through multiple entities which creates layers of communication, from author to editors to publishers to sellers to readers, yet, once the reader has hold of the physical book, it becomes a means of author-book-reader. This does not infer that the process of meaning-making in literature is a straightforward one; as Roland Barthes and others argue, the reader's key role in constructing connections and creating meaning results in the deconstruction of the strict 'author-book-reader' ideology, since the boundaries between the roles of the author and reader are blurred.[1] With E-Lit, the added layering of communication with the machine creates further complexity and thereby requires the user to be a more obvious co-producer.

This complexity and layering is seen in Montfort's *Taroko Gorge,* which is an open-source poetry generator that has been remixed by numerous other digital creators.[2] In this case, there is collaboration between the author, the countless layers of coding and hardware of the machine, and the work's experiencers. This chain is multiplied when considering how other

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[1] Roland Barthes, "The Death of the Author", in *Image-Music-Text*, trans. Stephen Heath (London: Fontana, 1977), 142–148.
[2] Montfort, *Taroko Gorge*.

versions of the work come into play. For instance, the same chain is replicated with Scott Rettberg's *Tokyo Garage*, but it also communicates with Montfort, his work, and his experiencers, as well as that of every other remixed version of *Taroko Gorge*, thus creating a multifaceted communicative link and a more extensive space for meaning-making for each user. Moreover, with new technologies continuously being created, E-Lit creators make use of the new mediums and affordances available to them to provide fresh ways of experiencing and engaging with literature. However, this constant newness of technology, as discussed in the previous chapter, unfortunately results in certain E-Lit works becoming lost if they are not archived or constantly renewed to match new media and devices. Ironically, although print's material is less durable, does not advance along the years, and is more liable to tears, holes, and other damages, its literature is more long-lasting than E-Lit that rapidly becomes obsolete or less accessible.

Electronic literature is also multimodal and multidisciplinary, which affects the way it can and should be engaged with. While most print literature does the same thing in terms of the physical act of reading, each E-Lit work is singular and distinct to other works of E-Lit, which explains why many provide users with instructions on how to 'read' and navigate the work prior to engaging with it. One central reason for this is how the two mediums portray language differently. Language is intrinsic to traditional literature, as most provide the literary experience through the letter, which is why persons who engage with such literature are known as 'readers'. Electronic literature is more diverse, in that it brings together images, animations, design, code, and different platforms to provide a more rounded and extensive experience, in fact resulting in the role of the reader becoming more so of a user/interactor/player/experiencer. Therefore, as Mario Aquilina and Ivan Callus argue, 'to be concerned exclusively with [the letter] when reading electronic literature is a category mistake', as language in E-Lit is only

one of multiple components put together to convey the literary.[3] Language itself is more fluid in E-Lit, as due to technological affordances, creators play around with language which moves, contorts, fades and comes back again, and so much more. This often causes users to approach language and literature differently, as especially when the work denies readability, users must find new ways to engage with the work and construct meaning. Due to this, there is also a need to change the way in which literature is analysed and discussed with E-Lit. Medium-specific analyses, to use Hayles' term, encourage theorists to think about the weight that the medium holds on how a literary work functions and is presented to users.[4] The materiality of digital literary works must therefore be central to a discussion of E-Lit, as it is clearly a central factor in not only what E-Lit does, but how it does so differently than traditional print.

Yet, despite all of this, along with claims that with electronic literature comes the 'end [of] literature', according to Hillis Miller, print is still making a splash in today's digital world.[5] It is undeniable that until now, electronic literature sits among the niche of literary communities while print literature continues to dominate discussions, learning programmes, and mainstream literary journals globally. Given that E-Lit provides new, innovative, and multi-sensorial literary experiences using a medium which has swept over societies around the world, it is fair to question why it has yet to become the new normal of literature.

First and foremost, tradition is a strong component, and with centuries of print dominating people's views when thinking about literature, it is understandable that books continue to hold a special place in people's hearts. This emotional attachment is further strengthened by the physical aspect of the human-book relationship. A physical book engages the readers' senses in a way which is unique to the medium, such as the smell of a newly bought

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[3] Mario Aquilina and Ivan Callus, 'Thirteen Ways of Looking at Electronic Literature', *Electronic Book Review,* (2018), <https://doi.org/10.7273/nrf9-tw56>.
[4] Hayles, 'Print Is Flat, Code Is Deep', 67–90.
[5] Joseph Hillis Miller, *Others* (Princeton: Princeton University Press, 2001).

book or the tactile sensation of holding a book in one's hands and turning the pages. These familiar sensations have become a source of comfort for readers and are ones which, until now, cannot be replicated by a digital device. 'You can't replicate holding and smelling a book', says John Westwood, owner of The Petersfield Bookshop in Hampshire.[6]

The materiality of the book is therefore a key component in readers' relationship with print literature. Many readers enjoy creating a personal library by collecting books to sit upon their shelves, something which cannot be done with digital literature. In his essay 'Unpacking my Library', Walter Benjamin speaks of the joys of collecting books as an avid collector himself; 'O bliss of the collector, bliss of the man of leisure'.[7] For him, the very act of owning books in itself forms an intimate relationship between the collector and the object, and this relationship with the physical item allows for a deeper connection with its contents and with the experience of reading as a whole. Moreover, the actual material of books themselves also contributes to readers' emotional attachment to the medium. The main component of books – paper – comes from nature, which is a fundamental aspect of human existence, and which relationship with humans is multifaceted and innate. Contrarily, technology is manmade, not natural. Humans' relationship with the materiality of technology is therefore not instinctive, but artificial. Additionally, since the purpose of books has always mainly been and continues to be about providing literature to readers, the book itself has immediate connotations in people's minds. Contrarily, technology is not first and foremost used to provide literary experiences, but is today mostly used to connect to the World Wide Web for information, social media, and to engage in streaming content. As Jonathan Culler argues, 'most of the time what leads readers to treat something as literature is that they find it in a context that identifies it as

[6] Elle Violet Bramley, '"We've rediscovered the joy of reading": how customers are rescuing UK bookshops', *The Guardian*, 2023 <https://www.theguardian.com/books/2023/feb/28/weve-rediscovered-the-joy-of-reading-how-customers-are-rescuing-uk-bookshops?utm_source=dlvr.it&utm_medium=facebook>.

[7] Walter Benjamin, 'Unpacking my Library: A Talk about Book Collecting', in *Illuminations*, ed. by Hannah Arendt and trans. by Harry Zohn, (New York: Schocken Books, 1968), 59–67 (p. 67).

literature'.[8] Thus, since the medium of the book itself is tied to the literary in people's minds while the machine is not, it is more difficult to see the latter as a medium for the literary.

This bond between books and people has been mapped out in various works of literature. Works such as Ray Bradbury's *Fahrenheit 451* or Markus Zusak's *The Book Thief* remind readers of the power which literature holds, so much so that, like in real-life Nazi Germany, in these novels, books are outlawed and burned by a totalitarian government. Characters like Guy Montag and Liesel Meminger from Bradbury and Zusak's novels respectively highlight the deep connection between people and books, as they risk their lives to save as many as they can. Readers' relationship with physical books can also be translated to bookstores and libraries. Like with printed books, readers have a physical space to go to and be immersed in literature, and although they are not quite as popular in today's world, they are still places of solace for many readers worldwide. As main character Tookie in Louise Erdrich's 2021 novel *The Sentence* describes about the Native American bookstore she works in,

> It was more than a place, it was a nexus, a mission, a work of art, a calling, a sacred craziness, a slice of eccentricity, a collection of good people who shifted and rearranged but cared deeply about the same one thing—books. (Erdrich, 2021, p. 136)[9]

While especially with the Covid-19 pandemic countless bookstores have taken a hit in the past few years, people's rediscovered love for reading printed books shone in 2022, as, according to *The Guardian*, independent bookshops across the UK and Ireland reached a 10-year high in 2022.[10] Again, this underlines the bond between readers and physical books, as whereas one may easily access literature through e-books or engage with novel works of E-Lit using their digital devices, countless readers today are still drawn to the physical thing itself.

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[8] Jonathan Culler, *Literary Theory: A Very Short Introduction* (Oxford: Oxford University Press, 1997), p. 27.
[9] Louise Erdrich, *The Sentence* (New York: Harper, 2021), p. 136.
[10] Bramley, '"We've rediscovered the joy of reading"'.

Collaboration between Mediums

Although the print and digital materials are diverse and offer different literary experiences to readers, they are not detached from one another. Firstly, aspects of technology were anticipated in various works of print literature, which possibly influenced the creation of said technology. In the 1909 short story *The Machine Stops*, E.M. Forster describes a video call between the two main characters who live on opposite sides of the world, years before the first picture phone was invented.[11] While of course one cannot attribute the development of technology to fiction authors, their novels introduced the idea of new technological innovations to readers and mapped out how these innovations can function within society, whether positively or negatively. This desensitisation of the digital through literature therefore paved the way to how humans view and interact with technology today. Twenty-first century novels are still portraying possible future technological advances in an attempt to not only prepare readers for what is inevitably coming, but also as a pedagogical lesson as to what the world may become if it is taken too far, as Dave Eggers does in his 2013 work, *The Circle*.

Thus, from a genealogical perspective, E-Lit is what follows print and can therefore be seen as an extension of it. Many of E-Lit's core characteristics are not exclusive to digital media, but can be seen as digital extensions from what has already been done in print. As Aquilina and Callus explain, 'there is a genealogy of algorithmic, collaborative, constraint driven, experimental, interactive, intertextual, and multi-modal literature spanning centuries', thereby clearly pre-dating the digital medium.[12] Just as Thomas Pynchon's 1966 novel *The Crying of Lot 49* can be described as a narrative labyrinth due to the seemingly infinite intertextual references and storylines which all supplement additional meaning to the work, hypertext fiction such as Michael Joyce's *Reach, A Fiction* can similarly be seen as a never-

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[11] Edward Morgan Forster, *The Machine Stops* (London: Penguin Classics, 2011 [1909]).
[12] Aquilina and Callus, 'Thirteen Ways of Looking at Electronic Literature', p. 11.

ending labyrinth due to the numerous paths users can choose to either follow or ignore. For both works, therefore, users are free to choose which trails to pursue, resulting in varying interpretations and user experiences. Another example in which this is seen is Philip Zimmerman's 1993 work *High Tension*, which allows for multiple reading paths through an unconventional diagonal cut of its pages which readers must fold to reveal a mix of text and imagery. Similarly, the Oulipo are known for their unconventional book format and writing methods using constrained writing techniques and mathematics. Novelist and Oulipo member Georges Perec wrote his 1969 novel *La disparition* without using the letter 'e' from start to finish, as was the translated English version *A Void*. This can be comparable in computational media to generative literature, 'whereby an algorithm is used either to generate texts according to a randomized scheme or to scramble and rearrange pre-existing texts', according to Hayles.[13] Certain forms of E-Lit can thus be seen as extensions of print as they utilise some of the same techniques, and consequently offer a similar reading experience but through a different medium.

Despite these examples where print literature clearly disrupts readers' expectations of language and of the book itself, this kind of experimentation is the minority within the print tradition. As such, readers still approach any work of literature with expectations that the conventions of traditional literature are kept. It is even more so when approaching digital media given the unfamiliarity of the medium, when the temptation to attempt to read a screen as one would a page is inevitable for novice E-Lit users. As Hayles explains, 'the tendency of readers immersed in print is to focus first on the screenic text', a strategy which often leaves readers stunned and perplexed when fronted with works which use multimedia and other digital tactics to enhance the reading experience.[14] This all boils down to how language is presented, since

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[13] N. Katherine Hayles, 'Electronic Literature: What is it?', p. 3.
[14] Hayles, 'Electronic Literature: What is it?'.

language is traditionally at the core of literature. Hypertext urges users to interact with language primarily to reveal another 'page' of the work; codework uses machine-mangled language which forces users to take a step back and grasp meaning from the overall gist of the text and design elements, rather than through close reading; interactive fiction relies on the interactor (to use Montfort's term) to issue commands to the player character to co-write the narrative.[15] Thus, whereas language in print is mostly standardly displayed in the same way, readers' expectations are askew when presented with the interactive and unfamiliar letter in digital media.

Skeuomorphism as a Bridge between Mediums

Whilst it has been argued that E-Lit emulates some aspects of the reading experience of print due to the translating of literary techniques onto the digital platform, it should in no way be understood that digital literature is simply traditional literature on a screen. Through technological affordances, E-Lit alters the literary experience for users. One such way it does so is by engaging different senses. This can be seen in Millie Niss and Martha Deed's 2004 work *Oulipoems*, a generative work comprising of 'six interactive poetry Flash works' inspired by none other than the Oulipo group.[16] The third text, titled 'No War', is an interactive sound poem about the Iraqi and Afghanistan wars which mirrors the constrained writing techniques of the Oulipo through specific phonetic limitations. This work is not only generative, but strictly engages the auditory sense rather than offering a visual text to read, thereby providing an experience to users which is enhanced by the technological medium. Works which utilise VR (Virtual Reality) such as John Murray and Mark C. Marino's *The Hollow Reach* go even further by placing the user in a virtual environment where their senses are made to believe that

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[15] Nick Monfort, *Twisty Little Passages: An Approach to Interactive Fiction* (Massachusetts: MIT Press, 2005).
[16] Millie Niss and Martha Deed, *Oulipoems* (2004), Interactive Poetry, Constraint, Combinatorial, Generative, Flash, <https://elmcip.net/creative-work/oulipoems>.

they are physically in that space. This sensorial literary experience cannot be replicated by the book as medium, as it is only achieved with technological affordances.

Despite the machine enhancing the literary experience, due to the newness of the digital medium, some authors choose to mirror the print experience onto the digital as an intermediary. In an attempt to make the newness of the machine seem less intimidating, some authors represent the familiar medium – print – through the unfamiliar, what Hayles has coined 'skeuomorphism'.[17] She explains that this technique 'calls into a play a psychodynamic that finds the new more acceptable when it recalls the old that it is in the process of displacing'.[18] Skeuomorphs can take different shapes. The E-Mail icon, for instance, is a digital replica of an envelope, informing users that E-Mails are simply digital versions of the familiar hand-written letters. Also seen in examples of E-Lit, in Mez Breeze and Andy Campbell's VR video game *All The Delicate Duplicates*, the mechanics of the virtual world mirror real life.[19] For instance, experiencers must make the same hand gestures as if they were physically turning a page in order to turn a page of the virtual book hovering in front of them. The user is therefore comforted by the familiar within this unfamiliar virtual space and experience, and can immediately understand what needs to be done within this gamified literary experience.

While skeuomorphic E-Lit bridges the transition from print to the digital medium, there are also E-Lit works which go back to the traditional print medium for the sake of reinstating tradition. Still tied to the digital, these E-Lit works do not use print as it is traditionally used. Instead, they utilise the medium through the eyes of the machine, thereby connecting the two mediums and creating a unique literary experience. Here, just as traditional readers approach E-Lit as they would print, users now approach this kind of print literature through a digital

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[17] N. Katherine Hayles, *How We Became Posthuman* (Chicago: University of Chicago Press, 1999).
[18] Hayles, *How We Became Posthuman*, p. 17.
[19] Mez Breeze and Andy Campbell, *All The Delicate Duplicates* (2016), VR, Immersive Environment, Digital Storytelling, <https://elmcip.net/creative-work/all-delicate-duplicates>.

mindset, which is the only way to interact with the work as is intended. These works therefore go back to the print medium but function in a digital way. One example is Montfort's work *#! [Shebang]*, at face value a printed book with several poetic texts alongside some lines of code.[20] Materially, it is print, yet it is still a work of E-Lit. When interacting with the work strictly through the book, it can be perceived as a book full of some arguably strange poems and lines of code which mean nothing to the reader, as would be the case of *All The Names of God*. The literary significance is only brought out when viewing the work from a digital perspective, in how the code will behave when run through the machine. The code creates a seemingly infinite number of permutations, much more than is printed in the book, which no computer today can run to the poem's completion. It is interesting, therefore, that although the book is used as the medium, its literary meaning can only be understood through the eyes of the machine. The primary use of the printed medium, however, brings with it certain questions about how it relates, or does not relate, to other 'traditional' works of E-Lit which focus on the machine's materiality. For instance, whilst, as previously explained, Hayles views E-Lit as an 'event' that continuously happens in E-Lit given the multitude of layers constantly in communication with one another, she argues that the concept of the event does not translate onto printed poetry, as it is unchangeable and eventhood is found in the 'processual nature of electronic literature'.[21] However, as Aquilina contends, 'non-electronic textuality is always already not static' due to the involvement of the reader in interpretation of literary texts.[22] Moreover, whilst Montfort's work is technically printed poetry, as argued, it should be understood in context of print in collaboration with the digital medium which, as a result, provides even more complexity and layering within the 'event' that is experiencing the literary.

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[20] Montfort, *#! [Shebang]*.
[21] Hayles, 'Electronic Literature: What is it?'.
[22] Aquilina, 'The Computational Sublime', p. 349.

Another interesting work which brings together the printed book and digital screen is Amaranth Borsuk and Brad Bouse's 2012 work *Between Page and Screen*, which, like *#!,* also utilises a physical book which requires the machine to bring out its meaning. Yet in this case, the book itself does not contain any text, but hieroglyphics on each page which, when held up to a computer's camera with the designed program, is translated into a series of poems onto the screen. These poems tell the complicated love story between characters P and S – standing for 'print' and 'screen' – through playful love letters between the two 'as they struggle to define their relationship', according to the work's website.[23] Both through the work's theme as well as through its mechanics, Borsuk and Bouse explore the place which print holds in today's digitalised world by producing a book which can literally only be read through a machine's eyes. Thus, although the printed book is used, the way it is used is clearly digital. Just like the scanning of QR codes on printed material with a digital device to reveal a page on one's screen, the computer program of *Between Page and Screen* scans the symbols on the printed book to expose the textual narrative, as seen in Figure 11. Readers cannot approach the book from a traditional perspective, as all expectations of a traditional book – page after page of paragraphs of text – are not met. Users must therefore still rely on the digital to experience the literary.
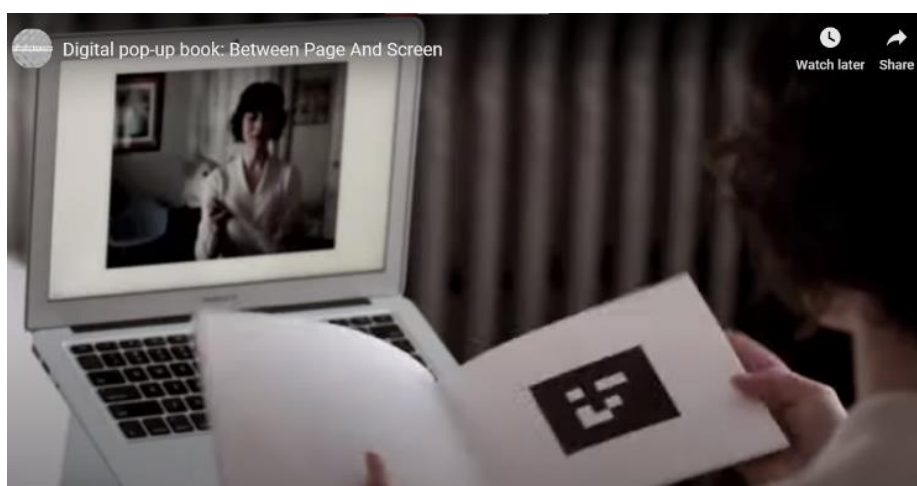

Figure 11

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[23] Amaranth Borsuk and Brad Bouse, *Between Page and Screen* (2012), Book Screen Hybrid, Augmented Reality, Poetry, Flash, <https://www.betweenpageandscreen.com/>.

Apart from relying on technology as the medium, the way the narrative is presented to users is also reflective of the materiality of the machine. Rather than standard paragraphs of text which mirror the reading experience of traditional print, this work makes use of the machine and its devices to create an interactive experience with moving text. Users are sometimes confronted with a paragraph on the screen in the form of a letter from one character to another, as shown in Figure 12, which then explodes into shrapnel once the page is turned. Other times, the machine's affordances are utilised by playing with three-dimensionality in the augmented space, as seen in Figure 13. Through the materiality of language too, then, users are provided with a space in which familiarity meets experimentation. There is therefore a collaboration between mediums. As the character S tells P in one of their love letters, 'You [the printed book] only get a portion of the stuff that makes me up'.[24] One complements the other. The symbiosis between the page and screen is what allows for the work to be experienced and enjoyed by users, highlighting that the mix between the conventional and the new – in this case printed books and the machine – can create an experience for readers which cannot be replicated solely with one medium or the other. Yet, at its core, the machine is what drives the narrative and allows for users to experience the literary, thus print here is used as an intermediary tool between users and the machine.
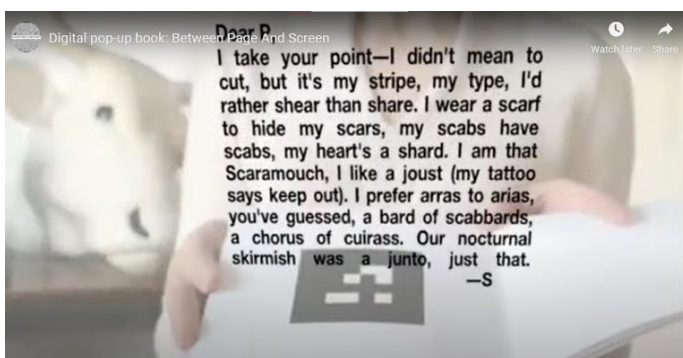

Figure 12

Figure 13

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[24] Borsuk and Bouse, *Between Page and Screen*.

The User's Relationship with Print and the Machine

One may question, however, the true reason as to why print is still a popular choice of medium amongst readers in today's digital era. Is the digital medium unfulfilling for those who seek the literary? Following centuries of expectations built up through print literature, is the literary experience users are provided through the machine unrewarding? One may first and foremost attribute print's popularity to readers' emotional attachment to the medium. The rapidly changing and variety of mediums for electronic literature makes it difficult for users to create emotional attachments with such mediums. Although the medium is always technology-based, E-Lit is represented through various materials. From a standard laptop or computer screen to a mobile screen, to a projector screen for illustration works or a VR headset, the physical materials which E-Lit requires are constantly changing. While of course this brings about positive results, such as that users are exposed to different sensorial experiences using new technologies, one downside is that readers cannot form the same emotional attachment that they have with books to these varying materials, since they are constantly changing. Moreover, with E-Lit, the physical ownership of that which represents literature is lost, as while digital works are more easily distributed and engaged with for users around the world, their transient nature disallows for users to have possession over that work as they have with a printed book.

Furthermore, does multimodality make the experience of electronic literature no longer feel literary, or has the hegemony of literature convinced us that literature must look and feel a specific way and no other? The literary has always been thought of as something which is found in writing, that is, in language. Whether through the oral tradition or found within printed books, the expectation of the literary has always been that it is found within how language is used and its meaning within the context of a story. This idea is problematised with electronic literature, as with its multidimensional, multi-disciplinary, and multimodal qualities, theorists have questioned whether certain works even constitute as literary. Nevertheless, the hegemony

of traditional literature throughout the years has undoubtedly shaped the way we think about literature and the literariness of literature, and how it should interact with readers, leaving traditional readers to question the literary value of digital media.

While the machine has undoubtedly provided innovative advances in society in countless areas and has changed the way that society functions, there are of course potential downsides to these sweeping technological advancements. Today, many of our day-to-day processes involve technology, resulting in the medium being normalised. E-Lit creators are thus creating new ways of still connecting users to the digital medium but in an innovative way, such as through a collaboration between print and the machine. As shown with *Between Page and Screen*, even print itself – something which one may argue represents the opposite of the digital as its primary raw material is natural and unchanging – is being given a role to play through the machine. The digital is therefore not only found within the medium of the machine, but, as David Berry claims, it 'is modulated within various materialities'.[25]

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[25] David Berry, 'Post-Digital Humanities: Computation and Cultural Critique in the Arts and Humanities', *Educause Review*, 2014 <https://er.educause.edu/articles/2014/5/postdigital-humanities-computation-and-cultural-critique-in-the-arts-and-humanities>.

Chapter Three – The Human as Medium: A Shift Towards Corporeality

User-Centred Corporeal E-Lit

As a result of the experimental nature of E-Lit, the role of those who engage with these works has greatly shifted from those who engage with traditional print. Users are no longer simply readers, hence the shift in vocabulary in using words like 'users', 'players', 'experiencers', or 'interactors' when referring to those who experience E-Lit. These words highlight a change in how the reader interacts with literature as well as what is expected of them. For example, in Michael Mateas and Andrew Stern's interactive video game, *Façade*, players are urged to take an active role by engaging with characters and personalising the storyline.[1] In Mez Breeze's VR work *Our Cupidity Coda*, readers turn into experiencers as the written words and vivid visual elements come together to create a holistic experience.[2] More than ever before, E-Lit today places users at the centre of the literary experience and immerses them within the virtual world.

Digital media provides a complex and multisensorial experience. One of the ways in which it does this is by engaging users' bodies as a corporeal tool in order to interact with the work, thereby requiring more physical input from users than with print. With most print literature, while the familiar tactiles and smells of the book add to the reading experience in the sense that they are subconsciously connected to the act of reading in our minds, in reality, the reader's physical input is limited. Readers must simply hold the book and turn its pages, two acts which are consistent with each and every book, regardless of their content, thereby making readers' physical contribution part of the reading experience, rather than an addition to the literary experience. On the contrary, the user's physical contribution in E-Lit is very work-

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[1] Michael Mateas and Andrew Stern, *Façade* (2005), Interactive Drama, <https://directory.eliterature.org/individual-work/3785>.
[2] Mez Breeze, *Our Cupidity Coda* (2017), VR Literature, AR, <https://elmcip.net/creative-work/our-cupidity-coda>.

specific, as each genre physically requires something different from the user. Yet, while the constant newness of E-Lit is a trait which excites many who engage with digital works, it has its disadvantages, such as the fact that until one becomes familiar with a certain genre and understands how it should be approached, another genre is on the horizon which defamiliarises the user from what they have just become accustomed to. Moreover, the rapidly progressing technological devices and systems often disallows for mass consumption and, as a result, Aquilina and Callus argue, 'there is the threat of its becoming obsolete, again and again'.[3] Thus, while the way one would physically engage with an E-Lit work is fluid and everchanging, the approach one would take with printed books has always been consistent. That's not to say, however, that this regularity in any way lessens the novelty of the literary experience when reading a new book, as the physical experience of engaging with a printed book is in itself a contribution to that experience as a whole. Of course, as argued in the previous chapter, there are exceptions to this familiarity with handheld books where a work of print literature requires more physical contribution from readers, yet these are the minority.

Taken one step further, E-Lit works such as hypertexts and interactive fictions call for users to interact more physically with the work by using the mouse to click on various webpages or typing commands into the keyboard. Already here, the engagement of the work firstly relies on the player's bodily involvement, then theoretically through the interpretation of the text. The multimodality of these works and several other E-Lit genres also contributes to the experiencer's physical contribution to the literary experience through an immersive and multisensorial experience, which, as Hayles argues, highlights human embodiment in electronic literature.[4]

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[3] Aquilina and Callus, 'Thirteen Ways of Looking at Electronic Literature', p. 250.
[4] Hayles, 'Print is Flat, Code is Deep'.

The user's physical engagement is further increased with works which require unconventional inputs from the user's body, or which incorporate the user's whole body as part of the work's production and reception. Oftentimes, users' bodies interact with technological interfaces and augmented realities, as well as with the physical world around them. Mark Hansen claims that our physical experiences with the corporeal world shape the way we function and understand that world.[5] Applying this to the way users physically engage with interactive electronic literature, their embodied experience results in a hyperawareness of the way their bodies connect with the machine, the physical and/or virtual things around them, and their current place within space and time. These works therefore utilise the body not just as a vehicle for the production of the work, but as a way of providing users with a corporeal experience to contemplate their phenomenological place in the world.

Interestingly, one may compare this type of E-Lit to the oral tradition. Just as ideas of art, literature, and culture were (and in some cases still are) expressed orally using the body as the medium, certain E-Lit which incorporates corporeality relies on the human body to animate the work and its message. There are also similarities from the listener's/experiencer's perspective, as both the oral tradition and corporeal E-Lit engage the receiver's senses in ways that print does not. There is thus a genealogical loop from the body to the text then back to the body, highlighting the importance of the body in producing and experiencing literature and media in general.

The Body as Material in Practice

The use of the body as medium has manifested itself in varying ways. From the use of specific limbs or one's whole body to the engaging of the senses to influence the work's creation or projection, creators of digital media have utilised innovative technologies and methods to

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[5] Mark B. N. Hansen, *New Philosophy for New Media* (Massachusetts: MIT Press, 2006).

create an interactive experience which is at the same time literary and corporeal. One of the ways in which this has been done is through the use of breathing. In Kate Pullinger, Stefan Schemat, and Chris Joseph's *The Breathing Wall*, which conveys the narrative of a deceased young girl and her boyfriend who was wrongly convicted of her murder and who are communicating with each other through a prison wall, the tale is told in a very interesting and interactive way.[6] Using innovative software to measure the physiological responses of the experiencer, the rate of the story's progression is directly affected by the rate of the reader's breathing. The more relaxed the user is, the more they are allowed to read and discover who truly killed the young girl. Thematically, this feature of the work is significant, as murder mysteries typically have the opposite physiological effect on whoever is consuming them. Yet here, Pullinger, Schemat, and Joseph are openly rewarding readers who remain calm by allowing them to progress in the storyline. Moreover, due to this, the work makes users consciously aware of their breathing habits, and in doing so, brings to light 'the intrinsic interplay between cortical and subcortical control at play in respiration', Astrid Ensslin et al argue.[7] This hyperawareness of a physiological action which is standardly a subconscious activity means that not only does the user influence the way the work functions, but the work itself subsequently affects the way the user physically behaves. *The Breathing Wall* is also multimodal, in that it combines text, images, videos, and sounds to immerse the user within the fictional world, and in fact, one cannot access part of the work without a microphone and earphones, ensuring that the senses are solely focused on the work itself. As is described, the work aims 'to induce a hypnotic or meditative state in the reader' in order to experience the

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[6] Kate Pullinger, Stefan Schemat and Chris Joseph, *The Breathing Wall* (2004), Physio-Cybertext, <https://elmcip.net/creative-work/breathing-wall>.
[7] Astrid Ensslin et al, 'Bodies in E-Lit', in *Electronic Literature in Digital Humanities*, ed. by Dene Grigar and James O'Sullivan (New York: Bloomsbury Academic, 2021), p. 94.

work fully, highlighting that the user's experience, both physically and within the fictional world, is of high priority for the creators of the work.[8]

Similarly, there are works which urge users to use parts of their body as means of interacting with the work. Known as interactive installations, these works provide a multi-sensorial experience which is proprioceptive and places experiencers in a three-dimensional space. A number of installations at the CAVE virtual reality projection site found within Brown University in the US highlight a collaborative experience between the human body and the machine, what Ensslin calls 'physio-cybertexts'.[9] One such work is the 2003 installation, *Screen*, presented at the CAVE by Noah Wardrip-Fruin and five other creators.[10] The work provides a game-like experience by placing visitors in a box where a text is projected on each side of the box and spoken out loud to the person. Once the text has been read, seemingly random words begin to loosen from the screens and float within the augmented space around the user. The experiencer must then physically engage with the text by pushing back words which have literally been pushed out of the text and are floating around the augmented space. Once the user pushes a word with their hand, it resorts back into the text, where it came from, in a different place, or split up to combine with other words within the text as neologisms. While the user may choose the order in which the floating words are pushed back into the text, they have no control over which words are pushed out in the first place and where the words are placed back as part of the text. Moreover, it is unclear whether the order in which words are pushed back makes a difference in where each specific word will be placed. It therefore seems as if the experiencer is given a false sense of control, and their physical role is not so much as that of an authoritative agent, but as a vehicle through which the work may continue

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[8] Pullinger, Schemat and Joseph, *The Breathing Wall*.

[9] Astrid Ensslin, 'Breathalyzing physio-cybertext', *Proceedings of the eighteenth conference on Hypertext and hypermedia,* (2007).

[10] Noah Wardrip-Fruin et al, *Screen* (2003), CAVE, Creative Language, Digital Art, <https://elmcip.net/creative-work/screen>.

progressing. Once the experiencer/player cannot keep up with the number of floating words and there are too many off the wall, all of the text becomes unattached, swirls around the reader, and falls to the floor. Yet, as is explained in the work's entry, 'playing "better" and faster keeps this at bay', which in turn prolongs the experience and affects the final text which is created through the player's bodily actions and read out to them by an omniscient voice.[11] Works such as this underline what Hayles calls 'cognitive assemblages' between the human and the machine.[12] The experiencer and the digital work engage in mutual interplay with each other throughout the work, as the user's corporeal motion affects the final version of the 'memory text', and the desire to play with and influence the work inspires the user's movements.

Just as installations require users to be physically at a specific site, locative narratives can often only be accessed by being at a certain location. Megan Heyward's *Notes for Walking* is only accessible and relevant at the Middle Head National Park in Australia, as it describes certain geological and historic features of a noteworthy location through a set of video 'notes'.[13] Other locative narratives do not require users to be in a specific place, but can be experienced from anywhere in the world. In Naomi Alderman's 2011 work *Zombies, Run!*, players are provided with a song playlist on their mobile phones which pauses every few minutes to relay a piece of narrative.[14] The work places users in the middle of a zombie apocalypse, and the player, known as 'Runner 5' in the game, is given an insight into the story from other characters who are trying to navigate this post-apocalyptic world. Users are also provided with instructions and help, as they would in a video game, such as to run faster if the fictional zombies are catching up to them, and where to go for medicines and supplies, the latter of which is personalised per player based on their actual physical surroundings. While the work

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[11] Wardrip-Fruin et al, *Screen*.
[12] Hayles, *Postprint*.
[13] Heyward, *Notes for Walking*.
[14] Naomi Alderman, *Zombies, Run!* (2011), Locative Narrative, Game, Zombies, <https://elmcip.net/creative-work/zombies-run>.

puts an interesting and active spin on a common post-apocalyptic trope by urging players to physically run in order to escape the dangerous zombies and hear more of the narrative, it also encourages players to become aware of their spatial environment by providing a map of where to find supplies and where not to go so as to avoid herds of the undead. In both of these works, the user is therefore used as a tool through which the text is brought out. The place of these bodies within their spatial environments affects how the text is brought out, as, for instance, the pace of the runners in Alderman's work alters the pace of the narrative itself. What can be said for both locative narratives is that they both make experiencers hyperaware of their physical environment and how their own bodies relate to that environment.

The Qualities of Corporeal E-Lit

As described, some works are distinct from other examples of E-Lit since they require users to be in a specific location, as the work cannot be wholly accessed or engaged with from anywhere else. Most E-Lit is accessible from anywhere, as long as the user has access to the computer or mobile to act as the work's medium, and must typically be connected to WI-FI. This means that works that depend on being present in a specific location are less accessible to users worldwide, highlighting both an issue of accessibility and that of exclusivity, especially if the work is only exhibited for a limited amount of time. To circumvent this problem, several works of installations and other site-specific narratives are videotaped and accessed through a streaming channel like YouTube. This allows worldwide users to view the work being engaged with from a third-person perspective. While this approach provides researchers and those interested in the work and the E-Lit genre to get a sense of how the work functions with real bodies, they still cannot interact with the work as was intended by the creators. This is the case in Wardrip-Fruin et al's *Screen*, which was recorded and posted on YouTube by one of the co-

creators, Andrew McClain.[15] On the other hand, *Zombies, Run!* can be downloaded and accessed by anyone with an iPhone, iPad, or Android phone, anywhere around the world even without a Wi-Fi or data connection. The portability of the two mediums – mobile phone/iPad and the user – means that the work can easily be accessed anywhere, anytime, resulting in easy access for users worldwide.

Moreover, these works create unique experiences for each user, every time they engage with the work. For those who are able to access the same installation, the way that one user interacts with the work and understands the relationship between their bodies, the textual literary output, and the machine itself, is different to another user. The experience also differs every time a user goes back to the work. This can be compared to how readers experience a printed text differently every time they go back to it by finding new or different meanings within the text, both through a deeper understanding of the work as a whole as well as through new nuances brought out through new life experiences and the reading of other texts. With an installation or locative narrative, for instance, the same sort of renewed experience is brought on by experiencers; however, it is taken a step further by the body itself interacting with the work in a different way now, leading to the uncovering of new ways that the body can interact with a literary work. These works therefore make users aware of their own bodies in relation to both their own spatial environments as well as to the machine. In *The Breathing Wall*, the experiencer's body engages in a cognitive assemblage with the mechanical medium, whereby the user's breath is the intermediary tool which communicates with the machine and moves the narrative along, just as one can consider the function of the mouse which is used to click on the next section when engaging with a hypertext work. With *Screen*, the user is placed in a site-specific box-like environment, but the work is experienced within an augmented space. The

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[15] Andrew McClain, *Screen Installation*, online video recording, YouTube, 28 March 2008, <https://www.youtube.com/watch?v=dSLChcV_a3o&ab_channel=AndrewMcClain>.

player engages with the text not directly through their bodily movements, but by the moving of the mechanical equipment attached to the player's arms, which are what allow the user to play around with the text. With each play, the user may choose which words to push back at which time, thereby not only creating a new experience for each user, but altering the text every time they engage with it. Similarly, Alderman's locative narrative provides each player with a different experience of the game, yet here, it is due to its reliance on real-world environments. As each experiencer begins a section of the game, their unique GPS location and running area is shared with the work, and certain features such as where to stop for medical supplies, where to avoid a group of zombies, and where to pick up people in need of help are personalised to each person in their own real-world location. This aspect encourages players to, while enjoying the narrative and getting fit, become aware of their corporeal place within their surroundings, and, through the tracked running map shown to the player after each run, highlights the machine's role in this recognition.

Despite the human body being used as a tool through which certain E-Lit is revealed and experienced, the machine's contribution is still central to the experience, given that it is, after all, still digital-born literature, thereby inherently tied to the mechanical medium. While the body captures the primary embodiment of the above discussed works, the software, projector and screen, and mobile phone respectively are key elements which bridge the user to the work. These mechanical tools, along with others such as laptops, wearable technologies, and AR/VR devices, are therefore necessary for users to interact with and experience these works, and function alongside the body.

A Deeper Dive into a Locative Narrative

34 North 118 West, a digital work by Jeff Knowlton, Naomi Spellman, and Jeremy Hight, is a prime example of a work which utilises the embodied human body to bring out a literary

narrative.[16] Similar to the previously discussed *Notes for Walking* and *Zombies, Run!,* this work is an interactive locative narrative whose story is brought out through the physical act of walking (or running, in Alderman's case). The narrative is set in a rail network setting in downtown Los Angeles during the early industrial era of LA. At the time the story is set, railroads were still at their infancy, and so, they were synonymous with totalitarian power as well as the modernisation of society. Through this, the game highlights the ways in which persons of different social standings were affected by this technological ingenuity. It does this by exposing the user to echoes of the different spirits which once inhabited the area at different times of history. It therefore provides players with a genealogical walk through the area with the guidance of spirits of the past to bring out stories of their times. The timing which incites each spirit to tell their tale is not strictly programmed consecutively, but each section is triggered when the user reaches the physical place which relates to that part of the narrative. With the GPS system activated on the user's tech device, the game knows where the user is physically located at any point while playing the game; thus, once the user reaches a particular location, the work activates a specific part. The player is provided with a map of the Santa Fe Railroad depot, which is today owned and used by the Southern California Institute of Architecture, and the voices they hear are from varying perspectives, including that of line watchers, who were workers on suicide watch who had to clean the human debris from the tracks whenever a person committed suicide. Due to the narrative and how players interact with the past, the work is known as 'narrative archaeology', that which 'uncover[s] and order[s] the past within the frame of the present', explains Rita Raley.[17] With the 'ghosts' of society's past reviving and retelling history from a then ostracised perspective, the work provides

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[16] Jeff Knowlton, Naomi Spellman and Jeremy Hight, *34 North 118 West* (2003), Locative Narrative, GPS, History, <https://elmcip.net/creative-work/34-north-118-west>.

[17] Rita Raley, 'Walk This Way; Mobile Narrative as Composed Experience', *Beyond the Screen*, 39 (2010), 299–317 <https://elmcip.net/critical-writing/framing-locative-consciousness>.

preservation of the deep history that the location holds by introducing it to the present and having it available for the future.

The socio-political aspect is therefore central to this work. Its aim is to revive the tragic stories of humble, low-class workers who spent their days at the freight depot during the turn of the century. This work, like several other locative narratives, reminds users that the space in which they currently stand was once different to how it is at their time, and that human beings before them stood at the same place in very different socio-political conditions. As Raley argues, 'mobile narratives engage not just physical, material space but also embodied, lived space', and this work illustrates this point through the way it connects locations with real life people's memories in and around these locations.[18] It underlines how the corporeal world does not simply exist, but is in a constant state of happening through human's engagement with the physical world. Humans' lives and memories are always in some way tied to a physical, material space, and this work highlights this concept while also drawing attention to the way this dynamic works through time. The persons who engage with the work through their technological devices may not be present within the exact same physical setting as the people whose voices ring through their headphones, due to both man-made and natural changes to the environment. Yet, the memories that these people make and all those who come after them will inherently be tied to those who came before them, even without their awareness of its history. The virtual space in which these memories lie is therefore sandwiched in between the real past and the real present, as it reverberates reality and is a reflection of the past. The varying layers of reality and virtuality are combined and influence one another, and here, memories are kept safe within the augmented space of the work.

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[18] Raley, 'Walk This Way'.

The user is therefore instructed to walk around the area and, in so doing, engages with the physical world around them. Due to the GPS system knowing exactly where the user's body is in relation to the environment, the work knows which part of the narrative to tell. The body therefore unknowingly communicates with the machine by giving it one's physical location simply by moving with the technological device in hand. The work is thus embodied through the user's corporeality, as it is their physical movement which is what allows the story to unfold. Consequently, the role of the body is the tool through which the narrative progresses, but apart from that, it does not engage in any other way with the work. While the experiencer physically interacts with their corporeal reality by walking around the Santa Fe Railroad Depot, and engages the senses of sight, sound, and touch by seeing, hearing, and touching the environment, their mind is sent to the past through the enriching stories of the various characters which take the users to the same place at a different time. Experiencers are therefore tied to both their own physical world and the augmented historic reality of the story-tellers. When something forces the user out of the virtual space to remember their physical reality, such as a vibrating phone which would not have been present within the fictional world's timeframe, the body and mind become open and responsive to their corporeal present. With the technological tools the user requires to hold and use to experience the work, this issue is consistent throughout the engagement of the work. While the devices are of course necessary for the user to engage with the work by hearing the stories of the past, they interrupt the user's delving into the speakers' stories by being a constant reminder to users that they are in their own time and space. Thus, the sensory connection to the technological devices comes in between the user's immersion within the work's reality as well as between the user and their engagement with the physical world around them. Unlike virtual reality, where the technological tools aim to provide a fully immersive experience with E-Lit, the devices in *34 North 118 West* act as corporeal reminders that experiencers are still within their own reality.

Here, the user sits in a space between reality and the digital, often blurring the boundaries between the two. In his text *New Philosophy for New Media*, Hansen calls this 'intercorporeality', as the user undergoes an embodied experience which intermeshes the technological and the real.[19] During this locative narrative, users are invited to both immerse themselves within the digital text and interact with their physical surroundings, providing an experience through which the body and the machine integrate in a new way.

The User's Role and Agency

Despite the user's central role in *34 North 118 West*, there are limits to their agency. While participants are able to physically move wherever they please, they must remain within the confines of the work's corporeal space. Moreover, while the linearity of the work depends on where the participant goes next, the narrative sections themselves cannot be reworded or changed in any way by the user. Thus, while the interpretation of the work as a whole will be different to each user, the core narrative of the work will always remain the same.

As explained, these works differ from other E-Lit works as they provide a more interactive and physical experience with the literary for users. From the players' perspective, their immersive experience within the fictional world through the engaging of various senses not traditionally used with literature allows for a deeper connection with the story's characters, themes, and plot. The idea of being lost within a fictional story is now not only constricted to the reader's mind, but to their physical stature also. Yet, the corporeal elements within these works do not only increase the work's immersivity and engagement, but also highlight the multimodal nature of the texts. From design in VR to audio in locative narratives, these E-Lit genres utilise modes of literary communication which are not necessarily tied to the written letter. Whilst they add a contemporary and unconventional layer to digital literature, the debate

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[19] Hansen, *New Philosophy for New Media*.

as to where the line is drawn between E-Lit and digital art due to these works' multimodality is one which is very relevant here and will be discussed further in the next section of this dissertation.

Thus, by creating a more embodied experience through an additional corporeal connective layer, such works make it easier for the user to become immersed within the story by physically engaging the user's senses and corporeally placing the user within the fictional world in some way or another. They also require a different form of attention from the user as they demand frequent physical involvement which deviates from the habitual motions of reading a printed book. As Rita Felski argues in her 2008 text, *Uses of Literature*, there is an emotional motive for engaging with literature, whether it is to 'recognise oneself in a book' and create a connection with a character, or to be shocked and alienated by the otherness of another world.[20] In Knowlton, Spellman, and Hight's *34 North 118 West*, the user experiences both affective qualities as a locative narrative. The stories of the desolate workers incite an emotional reaction from the player while instigating a sense of shock from understanding the horrible ways they spent their days, such as from the story of the worker who had to clean carcasses from people who died on the train tracks. Apart from hearing their stories directly through headphones which inherently allows for a deeper connection with the characters as it feels like a more personal conversation, the fact that users are physically seeing and walking through the place where the characters are describing creates another connective layer, as, despite that the area has changed through time, it is still the place where these all too real characters stood and worked.

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[20] Rita Felski, *Uses of Literature* (New Jersey: Blackwell, 2008).

The central use of the body in E-Lit works also brings into question the role of the reader. As Stephanie Strickland argues, 'to read e-works is to operate or play them'.[21] While the verb 'to read' can be questioned with these types of E-Lit works given their vast multimodality, the idea that the user operates and plays with a digital literary work is very relevant here. Several of these works which engage the user's body rely on it to move the story along, as is so with Stefan Schemat's 2004 *Wasser*, in which recipients are provided with tools and sent on a one-hour walk to complete a mission, during which the 'duration and speed of the narrative depend on the choice of the route the recipients take'.[22] The playfulness that Strickland alludes to is also central to these physically engaging works. Camille Utterback and Romy Achituv's interactive installation *Text Rain* embodies this trait by having users interact with falling letters on a screen by moving their bodies to catch the letters and attempt to create a coherent word or two.[23] In fact, when discussing this work in his 2011 text *Digital Art and Meaning*, Roberto Simanowski claims that the interactor's corporeal experience is a 'playful interaction between letter and body'.[24]

Through the increased physical engagement which these works provide users, players are given more agency in the way they choose to approach the work linearly, thematically, and physically. With traditional print literature, readers typically do not have a choice on how to read the text; the direction in which they read, the sequence of chapters, and the way they turn the pages are all common elements when engaging with one book or another, and are shared customs between readers which writers expect them to understand. While the way a printed book is approached is standard between readers worldwide, this of course does not mean that

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[21] Stephanie Strickland, 'Born Digital', *Poetry Foundation,* (2009), <https://www.poetryfoundation.org/articles/69224/born-digital>.

[22] Stefan Schemat, *Wasser* (2004), Augmented Reality, Locative Narrative, Space, <https://elmcip.net/creative-work/wasser?fbclid=IwAR3ffjRRF0o9s5f_ToP_ttTECV7EWnFMTnFOVxBAviLA8KAu-IUkZTXkXJs>.

[23] Romy Achituv and Camille Utterback, *Text Rain* (1999), Interactive Installation, shown at Brown University the CAVE, <http://camilleutterback.com/projects/text-rain>.

[24] Roberto Simanowki, *Digital Art and Meaning: reading kinetic poetry, text machines, mapping art, and interactive installations*, Vol 35 (Minnesota: University of Minnesota Press, 2011), p. 39.

every reader has the same literary experience with the same text. As Roland Barthes explains in his influential essay 'The Death of the Author', each reader begins a book with different expectations, views of the world, lived cultural experiences, and understandings from previously experienced books and other media, all of which contribute to the meanings and interpretations each reader takes from a text.[25] With corporeal works of E-Lit, users have both meaning-making responsibilities as well as decision-making. In VR works, players are free to move around and explore the simulated reality as they please. The interactions with and interpretations of the work are not only explored through the text itself, but visually through what the user sees in the designed virtual world, aurally through what they hear, and oftentimes tactilely through the items they can grab, move around, and control. The added layer of physical involvement therefore does not only allow interactors to have an immersive and engaging experience with a literary work, but provides agency to the user to discover the work at their own pace in their own way, thereby offering a user-focused literary experience. Once again, this increased freedom on users allows different users to choose the way they experience the work each time they engage with it, creating an exciting literary experience and being open to exploring and understanding new elements and implications of the text.

Yet, there is a limit to the user's freedom. Espen Aarseth explains that in hyperlink E-Lit, while the user may choose which hyperlink to press and therefore which thread of the story to follow next, there are limits to the user's agency, as the destinations of each link are always already predefined by the author, and the user only has access to the links which the author wants them to have at any given time.[26] Similarly, in locative narratives, the work often limits players to specific physical areas, and sometimes tells them exactly where they need to go next rather than allowing users to choose their next destination and narrative sequence. This is seen

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[25] Barthes, "The Death of the Author".

[26] Espen J. Aarseth, *Cybertext: Perspectives on Ergodic Literature* (Maryland: The John Hopkins University Press, 1997), p. 14.

in Janet Cardiff and George Bures Miller's *Night Walk for Edinburgh,* in which users experience an 'audiovisual walk in the streets of Edinburgh' as they must follow Cardiff's voice-led directions to reveal the tale of a murder mystery.[27]

In such cases, the user does not truly have agency despite being the primary embodiments of the works. Their bodies act as corporeal intermediaries between the digital work and the physical world, comparable to a laptop or tablet. This is even more so because it is the machine that controls the user's physical actions and movements in order to allow them to experience the work. Having said this, it is possibly inaccurate to compare humans to inanimate materials. While these mediums are utilised by users as means of accessing and connecting to digital literature, as the receptors of E-Lit, humans can embody these works by intertwining technology and the real world and creating a literary experience which the machine cannot do on its own. As Hayles explains, this embodied experience is 'based on the interaction of the body with technology and the physical world', especially through the user's senses.[28] The centrality of the user, both physically and cognitively, cannot therefore be lessened, as despite not having complete control over their embodied experience, their actions and choices are still what allow the work to be shown, interacted with, and ultimately enjoyed.

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[27] Janet Cardiff and George Bures Miller, *Night Walk for Edinburgh* (2019), Locative Listening, Audiovisual Walk, <https://elmcip.net/creative-work/night-walk-edinburgh>.

[28] Hayles, *Electronic Literature: New Horizons for the Literary*, p. 3.

Conclusion

The 'Literary' in Electronic Literature

Given the different ways in which E-Lit can be multimodal, multidisciplinary, and embody digital culture, its genealogical place within the institution of 'literature' may be questioned. The word 'literature' refers to 'pieces of writing that are valued as works of art', according to the Oxford English Dictionary.[1] While the latter part of this definition can surely be attributed to many works of E-Lit due to their artistic qualities and immersive experience, the word 'writing' underscores the fact that literature has always been associated with print culture. In Adrian Marino's tracing of the evolution of 'literature', he notes that from orality emerged the practice of writing which overtook its predecessor by philosophers, rhetoricians, and poets, thus orality is in itself not literature. According to Ivan Callus, 'the history of literature, the birth of literature, the idea of the biography of literature, is predicated upon the emergence of prose', meaning that within the space of literary criticism and theory, literature only began to be referred to as literature towards the seventeenth and eighteenth centuries.[2] Despite the concept of literature now encompassing various forms of print, including novels, short stories, plays, and poems, literature, and, as a result, the concept of the 'literary', have always been tied to the written letter. This leads to several questions associated with electronic literature; are E-Lit works which do not use the written word as their main form of expression truly literature? Are they literary? Does literariness depend upon the letter and its use? Who deems a work 'literary', and who decides whether it is categorised as 'electronic literature' or more broadly as 'digital media'?

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[1] Oxford Learner's Dictionary, 'literature', in the *Oxford Advanced Learner's Dictionary* (Oxford: Oxford University Press).

[2] Ivan Callus, 'Literaturelessness', *CounterText*, 5.1 (2019), 89–113 (section XV) <https://www-euppublishing-com.ejournals.um.edu.mt/doi/10.3366/count.2019.0152>.

At the centre of these important questions is the concept of the 'literary', which initially sprung as a way to describe written literature. Marino contends that 'whatever is "literary" refers to "letter," to *literalis*', thus for him, the idea of the 'literary' is inherently and undoubtedly tied to the letter.[3] According to James Corby, there are two possible definitions for the literary: the first is that which immerses the experiencer and urges them to view the world differently, while the second is 'the historicised cultures, forms, and institutions of "literature"', that is, literature which instigates a shift within its institution.[4] Thus, following Corby's first definition, the literary may not exclusively be found in literature, as other modes of media may possess similar aesthetic qualities and themes which might be defined as literary. For instance, the 2004 film titled *Eternal Sunshine of the Spotless Mind* may be considered a literary film as it utilises several devices commonly found in literary literature, such as a nonlinear narrative structure, elements of magical realism, and complex themes which explore the human condition and the multifaceted nature of memory and love.[5] So, it is possible to argue that the concept of 'literariness' may not be strictly associated with one art form, but can be attributed to works of varying disciplines. As Corby argues, the 'literary' is 'something that precedes, exceeds, and can survive the institution of literature, while still being the essential quality that founds literature'.[6] Thus, while literariness may not be singularly bound to literature, it is still a quality which separates literature from other written content, such as magazines and newspapers, and is still primarily found in literature as opposed to other art forms, for now at least.

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[3] Adrian Marino, *Biography of "the Idea of Literature", The: From Antiquity to the Baroque,* trans. by Virgil Stanciu and Charles M. Carlton (Albany: SUNY Press, 1996), p. 90.
[4] James Corby, 'The Post-Literary, Post-Truth, and Modernity', *CounterText*, 5.1 (2019), 33-69 (p. 39) <https://www.euppublishing.com/doi/abs/10.3366/count.2019.0150>.
[5] *Eternal Sunshine of the Spotless Mind*, dir. by Michel Gondry (Focus Features, 2004).
[6] Corby, 'The Post-Literary', p. 33.

The Institutionality of Electronic Literature

While it is being suggested that literariness may be found in various art forms and disciplines, the fact that E-Lit can be literary does not necessarily mean that it is literature, since, as explained, the concept of literariness and the traditional literary form are not inherently tied to one another. As shown throughout this dissertation, electronic literature takes on varying forms and utilises numerous modes and mediums to provide users with a fresh literary experience. Based on its contemporary usage, the term 'literary' may be attributed to numerous works of E-Lit as they too display aesthetic qualities and highlight issues which urge experiencers to re-evaluate certain ideas surrounding subjects such as humans and the world around them, socio-politics, and literature itself, amongst others. The word 'literature', however, becomes more problematic within the context of E-Lit. Since, as previously outlined, literature is inherently associated with the 'letter', and several works of E-Lit, such as VR E-Lit, certain installations, and many locative narratives, do not use the written word as their primary mode of artistic expression, it is fair to question whether these works should be identified as 'literature' or as part of the wider category of digital media. Some works currently fall under E-Lit not because they are clearly works of literature but due to the institutional politics of the arts which push works into specific categories in order for them to be more easily recognised, accessed, and studied.

For works of E-Lit, this categorisation has been and continues to be done primarily by the Electronic Literature Organization (ELO), which was established in 1999 by E-Lit creators and theorists Scott Rettberg, Robert Coover, and Jeff Ballowe. According to its homepage, the ELO is 'an international organization dedicated to the investigation of literature produced for the digital medium'.[7] Within the website, users may find an 'Electronic Literature Directory',

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[7] Electronic Literature Organization, 'WELCOME TO THE ELO', *Electronic Literature Organization*, 2022 <https://eliterature.org/>.

which contains an extensive but by no means complete index of globally-created E-Lit works and E-Lit's antecedents. Another research resource also created by Rettberg and other E-Lit theorists is The ELMCIP Knowledge Base, which contains cross-referenced creative works, critical writings, databases, teaching resources, journals, and more, related to electronic literature. The works placed within these websites are those which the institution has deemed 'literary' (by whatever definition) enough to be part of the category of electronic literature rather than of digital media as a whole. By these works being within the ELO and ELMCIP directories – locations where scholars, students, literary theorists, critics, and engagers of E-Lit in general go to find information on E-Lit works, creators, and theorists – they have become authoritative figures within the field, and thus whatever is placed there is seen as belonging within the electronic literature institution.

One example of a work which is under the ELMCIP directory yet its E-Lit status may be questioned is the first-person video game *What remains of Edith Finch?*, created by developer group Giant Sparrow and published in 2017.[8] In the game, the player takes on the role of seventeen-year-old Edith Finch, who is the last remaining member of her family, and who explores her familial home uncovering secrets and solving mysteries. From a user's perspective, the work acts as a video game, so much so that it is playable on video game consoles such as Xbox and PlayStation rather than on a computer. Yet, it is not difficult to identify the literary qualities of video games such as this one; as Mona Bozdog and Dayna Galloway argue, the work 'engag[es] with literary structures, forms, and techniques; deploying text in an aesthetic rather than a functional way'.[9] However, a work being literary does not mean that it is literature. As explained, the literary may be found in various forms of art,

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[8] Giant Sparrow, *What remains of Edith Finch?* (2017), Video Game, Narrative Game, Story, <https://elmcip.net/creative-work/what-remains-edith-finch>.
[9] Mona Bozdog and Dayna Galloway, 'Worlds at our fingertips: reading (in) What Remains of Edith Finch', *Games and Culture*, 15.7 (2019), 789-808 (p. 789) <https://journals.sagepub.com/doi/10.1177/1555412019844631>.

including video games, television series, film, and more. Thus, the appeal to place these works aside electronic literature simply because they are literary is not necessary, since, due to their main element being the visual design which principally interacts with the players rather than the written word, one may claim that they are not really literature and should thus not be categorised as such. The same may be said about other video games, including *Uncharted*[10] and *The Last of Us*,[11] as well as several works of other genres such as VR, locative narratives, and installations which are also cited under ELMCIP.

Just as these works' place within the ELO directory are questioned due to their 'literatureness', there are other works which may be categorised as E-Lit yet may not exhibit literary qualities. With traditional literature, while one may inherently assume that a work of literature is literary purely because it is categorised as 'literature', it may not be the case with E-Lit. Electronic literature in itself does not claim to be literary, nor does the institution of E-Lit do so. There may therefore be a situation in which what is called E-Lit may not necessarily be literary, thus arise further complications in defining these terms. If not all which is categorised as electronic literature claims to be literary, does, and if so, should, the term E-Lit encompass both literary and non-literary works? If it does include non-literary works, what distinguishes 'E-Lit' to 'digital media'? To this effect, we should also consider the way in which the institutional contexts within which E-Lit functions affect the way works are categorised, which is why it is important to continue to question that which seems clear.

Nonetheless, while Robert Coover and other members of the ELO canonised the term 'electronic literature', perhaps it should be questioned whether E-Lit even ought to fall within literature's institution. In the Editorial to the third volume of *CounterText*, Ivan Callus and

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[10] Naughty Dog, *Uncharted: Drakes Fortune* (2007), Video Game, Narrative Game, Adventure, <https://elmcip.net/creative-work/uncharted-drakes-fortune>.
[11] Sony Interactive Entertainment, *The Last of Us* (2013), Video Game, Narrative Game, Zombies, Violence, <https://elmcip.net/creative-work/last-us>.

James Corby assert that 'it seems increasingly implausible to rely on the term *literature* to serve as an adequate way of naming the various diverse and evolving contemporary manifestations of the literary', a statement which accurately describes E-Lit's predicament.[12] Thus arises yet another issue; if the term 'literature' does not encompass the newfound modes of experiencing the literary, what term will? Should the definition of 'literature' be rethought to include literary digital media? Should another term be conceptualised which incorporates the traditional idea of 'literature' and beyond? To whom should the responsibility of coining these new terms be given if not the representatives of the E-Lit institution worldwide, the ELO? Perhaps this dissertation has raised more questions than it has answered, but, as Marjorie Garber states, 'the genius of literary study comes in asking questions, not in finding answers', and with the ever-increasing possibilities for the literary which E-Lit brings along, there is no doubt that there are and will be countless more questions to be pondered upon.[13]

E-Lit and the Post-Literary

While these questions remain unanswered, there is a term which may describe the era in which literature as we know it is overpowered by the new: the 'post-literary'. Corby argues that the post-literary can suggest one of two possibilities: that literature ceases to be autotelic and is only concerned with the socioeconomic state of literature, or that the literary has arrived at a stage in which it is no longer predominantly found within print culture. The first possibility, he contends, is already an 'ever-present reality' due to the institutionalisation of literature and the socioeconomic circumstances which come with it.[14] The second possibility suggests that the post-literary is the stage during which literariness 'is most excitingly and effectively present and emergent' within forms outside of traditional literary culture.[15] Instead, literariness in the

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[12] Ivan Callus and James Corby, 'Editorial', *CounterText*, 3.1 (2017), v–viii (p. v) <https://www.euppublishing.com/doi/abs/10.3366/count.2017.0070>.
[13] Marjorie B Garber, *The Use and Abuse of Literature* (New York: Pantheon Books, 2011), p. 14.
[14] Corby, 'The Post-Literary', p. 40.
[15] Corby, 'The Post-Literary', p. 40.

post-literary era is mainly found within other forms of media, due to their emerging importance and multimodal nature. Therefore, although, as has been argued, other forms of art outside of literature can have literary qualities, the post-literary epoch highlights a change in mindset whereby literariness is no longer first and foremost sought after in literature, but primarily within these different art forms. In a similar discussion of what Callus calls 'literaturelessness', a state almost synonymous to the 'post-literary', he notes that 'it is the being and experience of that outside, in its different temporalities and spaces'.[16] As a result, Corby asks, 'are we, therefore, living through a period of the slow degenerescence of our historically dominant literary culture? Are we living in the post-literary in that sense?'[17] If one were to take Corby's second definition of the post-literary, then it is true that contemporary society is heading towards the post-literary era, as the newness of non-traditional media has, to an extent, submerged traditional forms of the literary. With the affordances of today's digital media and the ability to find the literary elsewhere, as well as how this affects the institutions and structures of 'literature', literaturelessness signals the dissociation of society with the traditional understanding of what literature is, what it looks like, and how it is experienced, mainly through print culture. That society is slowly reaching that state is a fair assumption to make, and is not entirely negative nor positive.

This societal development is due to several factors, yet the increased popularity and fascination with Artificial Intelligence (AI) and the role it plays in art, literature, education, and many other sectors today is surely a main component.[18] In Sarah Thorne's 2018 paper titled 'Hey Siri, Tell Me a Story: AI, Procedural Generation, and Digital Narratives', she talks about the implications of AI authorship, bringing in two examples of short films which were written

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[16] Callus, 'Literaturelessness', section XI.
[17] Corby, 'The Post-Literary', p. 40.
[18] Whilst AI has not been a main focus throughout this dissertation, its role within how we understand materiality in E-Lit in contemporary society, as well as its effect on the development of certain definitions, is an important point to raise and calls for further discussion.

by an AI screenwriter and exhibited in 2016 and 2017.[19] Five years later, AI has developed even further, most notably with the introduction of ChatGPT, an AI chatbot conveniently accessible from any technological device in most worldwide countries. Despite its technological ingenuity, it has produced several issues within the educational sector, as the skills of language-learning, researching, writing (both creatively and academically), and critical thinking are being lost, since students may immediately turn to AI for a quick-fix answer to their home assignments. Within minutes, ChatGPT can write an assignment, short story, play, film, or essay with very few prompts, an aspect which threatens how society values writers, literature, and art in general, as well as triggers questions surrounding creativity, originality, authorship, and ownership. Thus, while the insights highlighted in this dissertation have been limited to the niche study of E-Lit, they have today become a major point of social discussion, where the relationship between the machine and human author has become crucial to several areas in contemporary culture.

E-Lit itself, though having the word 'literature' in its name, forces us to question whether, and if so, how, literature as we know it has changed as a result of technological advancements. It seems that genealogically, E-Lit today is in some ways going back to the oral tradition, that which does not use the written letter but which connects with an audience by engaging the senses and experiencing a collective enjoyment of the arts, rather than the secluded and quiet experience one undergoes with written literature. For instance, Ian Hatcher's hypertext work *Signal to Noise* is meant to be engaged with by several users simultaneously and each person's interaction affects the others' texts and experiences, thus creating a combined literary experience.[20] If we are once again gradually moving towards this

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[19] Sarah Thorne, 'Hey Siri, Tell Me a Story: AI, Procedural Generation, and Digital Narratives', in 'Electronic Literature Organization 2018: Mind the Gap!' conference at the University of Quebec, Canada, 13-17 August 2018.

[20] Ian Hatcher, *Signal to Noise* (2007), Hypertext, Interactivity, Collective Navigation, <https://elmcip.net/creative-work/signal-noise>.

congregated performance to experience the literary, and we now call this practice 'literature', should the oral tradition's place within the institution of literature be re-evaluated, or should the current benchmarks for what constitutes electronic literature be reconsidered? It seems that due to E-Lit's significant multimodal and multidisciplinary nature, the line between literature in the digital age and digital media in its entirety has become blurred, the result of which is a dilemma within the institution of literature, its definitions, and its categorisations.

Materiality and the 'Literary'

One of the central reasons for this ambiguity is materiality. The materials and mediums through which a work is produced, shared, and engaged with greatly influence the literary experience for users, as has been shown throughout this dissertation. The change in medium from print to digital for art has brought with it new and unique affordances for the literary, but has also increased questions on what literature in the digital age means. In the ages when print culture dominated the literary scene, most books looked and felt the same, and thus created an association in people's minds between what they saw and felt and the literary experience. The printed book thus became a material representation of the literary. However, with technological advances sprouted a new opportunity to create an experience of a similar kind through a different medium. As Hayles argues in her article 'Print is Flat; Code is Deep: The Importance of Media-Specific Analysis', with the birth of E-Lit came the need for a new way of analysing the literary, now with a larger focus on the medium through which the work is experienced, as it affects both the relationship between users and the medium as well as between users and the literary effect.[21] This is for three main reasons: the first is that the machine is not inherently associated with the literary as is print; the second is that E-Lit utilises a variety of mediums, often several together in one work; and the third is because literary works are now being viewed

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[21] Hayles, 'Print Is Flat, Code Is Deep'.

and engaged with differently than ever before and varyingly between each and every work, thus not allowing users to emotionally connect with one medium before moving onto the next. Therefore, by understanding the role that materiality plays during a work's creation, distribution, and the 'event' of experiencing a work as well as in constructing meaning, we can more deeply identify the literary within the work and recognise its place within the broader institution of literature and digital media. It also allows us to understand the communicative layers between us as readers/users and the 'literary', us as readers/users and literature, and us as readers/users with print and the machine as literary mediums, both individually and collectively as a community. What is for sure is that with more technological advancements and human creativity, digital media, electronic literature, and literature as a whole will continue to evolve and redefine the literary experience for generations to come.

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