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**Author(s)**  
Colreavy-Donnelly, Simon

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I-Ulysses: Poetry in Motion. An educational virtual reality guide to the unfolding events of the ‘Wandering Rocks’ chapter of Joyce’s Ulysses.

Thesis submitted in part completion of Digital Arts Humanities PhD
Huston School of Film & Digital Media
National University of Ireland Galway
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By
Simon Colreavy-Donnelly

Supervision Team:
Dr. Sean Crosson, Huston School of Film & Digital Media, National University of Ireland Galway
Dr. Sam Redfern, College of Engineering & Informatics, National University of Ireland Galway
Professor Brian Caraher, Department of English, Queen’s University Belfast
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I-Ulysses: Poetry in Motion

A spatial and temporal virtual reality experience, guiding the user through the unfolding events of the ‘Wandering Rocks’ chapter of James Joyce’s *Ulysses*. This is an educational tool intended to help the user understand key aspects of the chapter. These key aspects include: the use of character’s multi-linear perspectives on events; differing time zones and perception of reality; the streetscapes of Dublin city; daydreams and consciousness. Joyce’s literary techniques are explored through the use of this educational virtual reality tool.
I-Ulysses Introduction

1.1 Overview

The I-Ulysses project uses virtual reality tools to adapt the distinctive aspects of James Joyce’s work. It uses aspects of the virtual reality medium to adapt the story of Ulysses. The I-Ulysses project adapts the ‘Wandering Rocks’ chapter of Joyce’s Ulysses into a multi-linear, interactive setting. This virtual environment can serve as a learning guide for students and can help academics teaching courses on Ulysses. It adapts the innovative techniques that Joyce used in the ‘Wandering Rocks’ chapter: the interior monologue, multiple points of view, cutting between characters and the use of technological tropes as storytelling devices, employing the multi-linear, spatial and hypertextual functionalities of virtual reality.

The I-Ulysses environment will aid a prospective user in understanding Joyce’s innovative writing techniques, such as his use of the interior monologue technique, his use of audible directional sound cues and the use of technology as a storytelling device. It will help the user understand Joyce’s non-linear approach to narrative by adapting Ulysses into a spatial environment. Here key emphasis is placed on exploring the simultaneity of thought, action and juxtaposition of different character’s points of view, in a spatial setting. The practice portion of the PhD is a 3-D virtual adaptation of the ‘Wandering Rocks’ chapter of Ulysses. The environment can serve as a learning guide for students and academics studying or involved in the
teaching of *Ulysses*.

This research qualitatively addresses a number of theoretical and practical issues; firstly, whether or not it is possible to adapt *Ulysses* into another format other than the written word. Secondly, it will consider if a spatial adaptation can represent narrative or storytelling concepts developed by Joyce more effectively than other media, such as cinema. Thirdly, the research will address the qualitative value of providing interactive digital adaptations of literary scenarios and other types of spatial multi-modal content using a 3-D virtual reality environment.

1.2 Research Question

The research question of the project underlines a number of points relating the use of a virtual reality adaptation to understanding *Ulysses*. The research question is:

Can a virtual reality adaptation of *Ulysses* facilitate the user’s understandings of the innovative storytelling techniques that Joyce employed in ‘Wandering Rocks?’

As the thesis progresses it will look specifically at what new learning techniques are possible to create using a virtual model to adapt the distinctive storytelling techniques that Joyce employed in *Ulysses*. It will consider cases where Joyce’s text is difficult to adapt outside the print medium. Where the thesis dwells upon these cases it emphasizes the possibility for new learning in the fields of Joyce Studies and Digital Humanities through critically interrogating the research question. In each of
these cases the reasons why Joyce is difficult to remediate will be detailed and the new ways that I-Ulysses adapts the novel will be noted and contrasted with previous work done in this area.

Joyce pioneered a number of unique storytelling devices in *Ulysses*. In the thesis it is argued that several of these techniques have unique spatial and temporal qualities that are especially effective when experienced in a virtual reality setting. The most significant of these techniques include:

- His use of the interior monologue technique, whereby the reader is given access to a character’s inner thoughts.
- Use of multiple points of view, where readers see the overall network of spatial and temporal associations between the different characters.
- Use of technology as a storytelling device. Joyce attempted to replicate or synthesize the aesthetic styles of the film and radio mediums in his writing; he also included technological devices in the text, with characters having telephone conversations, taking trams, listening to the radio, or thinking about scenes from films.
- Use of sound effects: Joyce used sound to spatialize and connect characters’ experiences across different geographical, spatial and temporal locations.

The main objective of the project is to create a template for prospective users to learn about aspects of Joyce’s work, using a virtual interactive model. The project will adapt key aspects of Joyce’s storytelling techniques and make them
conceptually easier for a user to understand. The scenarios that the student will learn about will be described in the ‘New Studies’ chapter; the techniques that the virtual environment adapts are discussed in the ‘Methodological Contexts’ chapter. The practical component of the thesis represents a vehicle through which the scenarios in Joyce’s work can be spatially and thematically understood by the user.

### 1.3 Learning Aims and Objectives

The environment’s primary objective is to facilitate a user’s understanding of the innovative storytelling techniques that Joyce employed in ‘Wandering Rocks’ and to encourage an active dialogue between the user and the process facilitated through interacting with the environment. The process of facilitation through active discourse and the manner in which this discourse interacts with the technologies employed in the project will be outlined in the ‘Methodological Contexts’ and ‘New Studies’ chapters. The central learning outcome for the student is to develop a spatial, goal-oriented overview of *Ulysses*; each goal or objective in the environment is designed to represent and respond to a specific storytelling trope that Joyce developed in *Ulysses*. The *I-Ulysses* environment adapts the storytelling techniques that Joyce employed in *Ulysses* into a virtual environment, with the functionalities of virtual storytelling and game development media creating a condensed overview of the novel’s structure. By interacting with the environment the user will be better able to:
• Separate out the interior monologue elements from *Ulysses* and the dialogue of its speaking characters.

• Explore the back stories of each character in a way that connects them to experiences or events noted in the interior monologue.

• Discern the character’s motives, in this way, without disrupting the flow of the book’s narrative.

• Explain the relevance of a specific character’s path and its relationship with the interior monologue *outside* the context of the ‘Wandering Rocks’ chapter.

• Discover more about the cultural world of Joyce’s *Ulysses* and Joyce’s main works, while being able to focus on its fine details.

• Describe a multi-linear perspective on the events of the chapter, rather than focusing on a single story at one time.

• Describe the events of ‘Wandering Rocks’ in a way that emphasizes the space, sound and interconnectedness of key audio-spatial events.

• Evaluate how Joyce used sound to connect events across different spatial and temporal locations.

The environment has been rendered in the *Unity* game engine. Distinctive aspects of the game engine were employed to provide an audio-spatial *equivalent* of Joyce’s content; an interactive sequence of Waypoints for a student to explore, which teach them about a specific combination of techniques that Joyce used in the chapter. Instead of focusing on the practical components of the research, the ‘Methodological Contexts’ and ‘New Studies’ chapters focus on providing a
theoretical methodological apparatus; showing how theories in DH and Digital Media Studies can mesh with fundamental aspects of Joyce’s work noted above and encourage a new learning template for students of *Ulysses* at both second and third level.

The *I-Ulysses* project is of value to academics studying Joyce and Digital Humanities scholars exploring multi-modality\(^1\) and Virtual Reality; it synthesizes a broad field of research contexts for these reasons. The different research contexts will be introduced in the ‘Review’ and developed in the ‘Methodological Contexts’ chapter. The practical component of the thesis will function as a distinct virtual environment; the primary research focus of the thesis to show how the environment produces new understanding of Joyce’s work. A catalogue of the components of the environment and the testing procedure used in the development process is provided in the ‘New Studies’ chapter.

As part of the project, user test groups were conducted to assess the value of the learning environment in a qualitative context. These tests were conducted at the University of Vienna as part of the *Remix Cultures* student seminar, at the National University of Ireland Galway through the undergraduate English course in NUIG and at the James Joyce Centre, Dublin. Respondents from each sample have demonstrated a high level of appreciation of both: 1) the novelty of the learning environment and concurrently 2) the unique narrative storytelling techniques that

\(^1\) Multi-modality is a term from Virtual Reality studies. It means to incorporate several types of auditory, visual and spatial information in one experience. The term will be further discussed in the ‘New Studies’ chapter.
Joyce employed in *Ulysses*. These tests are qualitatively evaluated in the ‘New Studies’ chapter, practically testing the thesis question.

The environment attempts to blend Joyce’s use of different kinds of storytelling techniques, outlined in the previous sections of this chapter, by embedding them within an immersive interactive environment. In the environment it is possible to see the adaptation of Joyce’s different techniques: sound, interconnections between characters, juxtaposition of space with different points of view and the use of technology. A user can focus in on one particular aspect of the story, without disrupting the overall flow of the environment.

At the same time, a user’s interaction with the environment precipitates changes in the order of events and gives them a sense of how their decisions result in new choices and outcomes. The structure of the *I-Ulysses* environment facilitates and provides a model for students to learn about *Ulysses* as part of a traditional learning framework, whilst also employing the motivational factors that a virtual model can impart; multi-sensory cues, context-sensitive goals and directional prompts (Dondlinger, 2007).

The environment also encourages a learning discourse within a traditional learning setting, by encouraging participation and interaction as part of a group. The models used for implementing this learning model are discussed in the ‘New Studies’ and ‘Methodological Contexts’ chapters, through the use of Randy Garrison’s Community of Inquiry model and the discussion of Dondlinger’s theories on
educational game design and Salen and Zimmerman’s work on serious learning and meaningful play. In the ‘New Studies’ chapter specific examples from Garrison, Salen and Zimmerman’s work will be demonstrated and applied to scenarios from the testing procedure, forming a set of practical test paradigms.

The introductory section has established the key issues to be examined in this thesis. The topic of focus for this research is whether or not it is possible to adapt Ulysses into another format other than text and, as part of this, whether or not a virtual reality adaptation can better demonstrate narrative or storytelling ideas developed by Joyce. The research demonstrates the qualitative value of providing interactive digital media adaptations of multi-layered literary scenarios and other types of multi-modal content. The research question points to and discusses Ulysses’ lending itself to this kind of ‘multi-modal’ adaptation. The main objective of the research is to assess whether or not the use of a virtual model and the application of Digital Humanities methodologies can produce new understandings of Joyce’s Ulysses.
2.1 Overview of the Research Topic

James Joyce’s *Ulysses* takes place on the 16\textsuperscript{th} June 1904 in Dublin and concerns the meeting of two men on that day: Leopold Bloom and Stephen Dedalus. While this meeting is the focus of the story it doesn’t happen until near the end of *Ulysses*. However in anticipating their meeting Joyce builds a complex, multi-layered portrayal of Dublin life on the day (Hayman, 1973, p.51). The correspondence between *Ulysses’* characters and its imagining of Dublin, with its allusions to key moments from history and actual events, makes it a rich literary and historical setting.

Joyce’s work presents a reader with a number of obstacles to overcome; separating the spoken word from narration and knowing the difference between thought and spoken words presents a challenge to the uninitiated reader. Joyce does not clearly mark speech in paragraphs, so it is difficult to know who is speaking, or who they are addressing. There is also a tension or an ambiguity in Joyce’s work around the understanding what is real, in the sense of things happening in or outside of a character’s imagination; the problematizing of these aspects of Joyce’s work is a primary consideration of the *I-Ulysses* project.\textsuperscript{2} A short overview of *Ulysses* follows.

Each chapter of *Ulysses* has its own unique style; these chapters are compared to

\textsuperscript{2} In a sense everything in the book is real or being experienced at some level by its characters.
episodes in the *Odyssey* after a schema developed by Stuart Gilbert (see *Fig 2.1*).

The tenth episode of the book is known as ‘Wandering Rocks.’ It concerns all the characters of the book in the same place at the same time, an area of about four square miles around the Dublin Quays (see *Fig 2.2*). In this chapter Joyce creates a complex network of associations between people and things that they have done, or will do later, in the day (see *Fig 2.3*).

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**Fig 2.1** Stuart Gilbert’s *Schema of Ulysses* breaks the book’s chapters down into relevant time, place, themes, and Homeric parallels (Herbert Gorman’s *Biography of Joyce*, 1963).
Fig 2.2 The above map shows the area around the Quays where the ‘Sirens’ and ‘Wandering Rocks’ chapters take place. Image used courtesy of the University of Vienna’s Paul Fagan.
Fig 2.3 A map of *Ulysses* from the Appendix of Herbert Gorman’s *Biography of Joyce*; this map was drawn by Vladimir Nabokov.

In respect of Joyce’s text and the critical discourse surrounding it there are a number of key terms, what will be called ‘presences’ in the text, that require defining. The key terms discussed here are intended to interact with the definitions of the four main storytelling techniques, identified by the author in the ‘Introduction’ chapter. The first of these presences is the spoken dialogue. This presence is acknowledged as being the voice of characters in a scene who are speaking aloud. The dialogue of characters is denoted by Joyce with the use of a semi-colon, though sometimes Joyce will not mark speech in the body of a paragraph in this manner. Another presence is the use of a sound or sound effects in a scene, such as the klaxon of a tram, the horn of a car or the sound of
a pigeon cooing. The interior monologue technique is perhaps the most
discussed element of Joyce’s storytelling techniques, representing the means by
which Joyce gives the reader an insight into the thoughts of his characters. The
narrator of the book is a separate presence in and of itself; in this way, the use of
specific sounds, speech and thought patterns are separated from the narration of
the book, though it may be difficult for a first-time reader to distinguish between
the narrator and the interior monologue in its later sections.

In many cases the ambiguity in the narrative is purposeful; in attempting to get
the reader to think outside of the conventional literary narrative, Joyce offers a
stream of conscious experience that can disrupt and distort the reader’s concept
of subjectivity and the polarity of spoken word and thought (Attridge, 1990, p.2).
The critical discourse involving these presences and the manner in which the
presences relate to the storytelling devices mentioned in the ‘Introduction’ will
be discussed in the ‘Arranger’ subsection.

2.2 Objective of Review

The objective of this ‘Review’ chapter is to connect the fields of Joyce Studies,
Digital Humanities and Digital Media Studies and provide an extensive review of
the materials referenced in the ‘Case Studies’ resources. First a brief overview
and history of the Digital Humanities will be given in order to contextualize the

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3 Specifically the debate around what has been described as an ‘Arranging’ presence will be
discussed, in terms of whether or not this is a useful model for understanding the mediation of the
text and what other theories and models may be useful in understanding it.
DH foundation of the *I-Ulysses* project. The theories of Patrik Svenson, Willard McCarty and Mathew Kirshenbaum will then be discussed to demonstrate how the Digital Humanities interacts with traditional humanities subjects. After the ‘Introducing Digital Humanities’ section the relationship between Joyce Studies, hypertext and Multi-Disciplinary Studies will be examined. In the ‘Joyce Studies and Hypertext’ section the work of Derek Attridge, David Hayman and Hugh Kenner will be referenced, giving an overview of Joyce Studies. In the following sections the theories of the complex narrative structure of *Ulysses* are connected to the discussion of hypertext, which is a central aspect of Digital Media Studies and Digital Humanities.

The final segments of the ‘Review’ will look at game development media and virtual reality studies and bridge the discussion of New Media and Joyce’s work specifically. Here the concepts explored in the earlier segments of the ‘Review’ will be meshed with the discussion of the project’s practice-based methodology, with a specific focus on learning and practice. The central objective of the ‘New Studies’ chapter will be to establish the links between the topics in the ‘Review’ and research conducted in the Digital Humanities and E-Learning fields, while reviewing the teaching and learning practice of the *I-Ulysses* project. The ‘Case Studies’ that follow shortly will discuss a number of projects that have used Digital Media in a similar way to the *I-Ulysses* project to enable new understanding of Joyce’s work with electronic media. The ‘Case Studies’ also note other projects that adapt literary works or narrative tropes distinct from Joyce’s work.
2.3 Introducing Digital Humanities

The research area of the Digital Arts Humanities (DAH) is part of the Digital Humanities discipline. While Digital Humanities (DH) is traditionally a text oriented discipline, meaning a principle focus on literary or historical texts and artefacts, the DAH has branched into the fields of Digital Art, Performance Art, Theatre and Fine Art. In order to position the I-Ulysses project’s research agenda, a brief overview and history of the DH is given below. Patrik Svenson describes how DH represents, “an integrated, interdisciplinatory and interactive approach to computer science, electronic engineering and humanities projects” (2009). Svenson gives an overview and history of DH projects in his paper Digital Humanities as Humanities Computing. He begins the paper by drawing attention to humanities scholars’ increasing employment of Information Communication Technologies (ICT) tools in their research:

An important aspect of the ongoing transformation of the humanities is humanities scholars’ increasing use and exploration of information technology, as both a scholastic tool and a cultural object in need of analysis (2009).

Svenson describes the DH as a combined research methodology: “currently there is a cumulative set of experiences, practices and models flourishing in what may be called Digital Humanities” (ibid). Svenson does not define the DH as a separate humanities discipline, but rather sees it as an approach to traditional humanities topics that use humanities computing tools. Svenson argues that DH sustains
both humanities and computing methodologies without crossing into or confusing their epistemic territories.

Humanities Computing began when the South American priest Robert Bursa developed the *Index Verborum* in 1949, a catalogue of all the works of St. Thomas Aquinas. As Bursa relates, “During World War II, between 1941 and 1946, I began to look for machines for the automation of the linguistic analysis of written texts. I found them, in 1949, at IBM in New York City” (Hockey, 2004, p.16). In 1960 *The Concordance Project* sought to employ ICT in their catalogue by using computers to archive literary and historical works, such as the *Early Middle High German Corpus*, the poems of Mathew Arnold and W.B. Yeats. Authorship studies followed in the 60’s with the electronic analysis of St. Paul’s *Letters* discovering that he did not write all the scriptures.

As Svenson, Kirshenbaum, McCarty and Hockey admit DH has traditionally focused more on literary, historical and language based projects than Digital Media, Digital Art and New Media: “text (here meaning written or physical text rather than computer games, blogs, websites and other forms of digital data) is considered a privileged data type in humanities computing” (ibid). Prior to Svenson, Mathew Kirshenbaum undertook his own analysis of DH and lists the reasons for its longstanding association with textual analysis in *What is Digital Humanities and What Is It Doing in English Department* (2001). Kirshenbaum focused on the new subject’s position in relation to English and language schools.
The use of modern computer technologies in both cultural and scientific analysis is now emerging as a distinct field of study in the Digital Humanities. Digital Humanities are traditionally identified by a number of theorists such as Susan Hockey, Mathew Kirshenbaum and Willard McCarty as an intersection point between the disciplines of Computer Science and the Humanities. Hockey notes that the research paradigms of DH use elements of both disciplines in practice:

Humanities computing have to embrace the two cultures of the humanities and technologies to bring the rigor and systematic unambiguous procedural methodologies characteristic of the sciences to address problems with the humanities that had hitherto been most often treated in a serendipitous fashion (2004, p. 3).

More recently digital humanities scholars, such as Patrik Svenson, have been interested in the relationship between humanities and digital media or material “that is considered natively digital in video games, blogs, websites” (2009). Part of this re-evaluation of digital material is also concerned with an interest in how traditional narratives are conveyed; with these new media settings video games form a specific topic for further examination. Willard McCarty notes the potential for modelling virtual worlds, a term that he uses to refer to virtual reality, in his overview of the Digital Humanities:
In summary I see the picture emerging from the current situation like this: a worldwide semi coordinated effort to create large online scholarly resources. Out of this activity the slow development of new genres in something like a digital library; analytic and synthetic modelling, on one hand to probe for contributions to the construction of meaning, on the other to reconstruct lost artefacts from fragmentary evidence, blurring gradually into a modelling for possible worlds (2007, p. 10).

As Svenson notes, DH has not looked extensively at Digital Media or New Media as pure topics of study but has focused on a combined approach with English, history and language departments. Patrik Svenson proposes a new approach including what he calls the natively digital settings such as blogs, video games, websites and other e-resources:

Humanities computing is mainly interested in digitalized texts and not material that is natively digital...most of these (digital) objects are studied and analyzed within different kinds of new media settings (like media studies, electronic engineering etc.) and to me this is an interesting in-between zone... would humanities computing be interested in engaging more with new media scholars (2009)?

Svenson focuses on examining the potential area of intersection between Humanities and Digital Media Studies. He refers to this as a synthetic approach where the benefits of both disciplines are meshed without undermining their respective epistemic territories. Svenson’s aim is to encourage a more involved dialogue between DH and Digital Media Studies, with a specific focus on natively digital objects and settings, such as video games and virtual reality.
Willard McCarty, a longtime collaborator of Kirshenbaum, draws a distinction between analysis of data and producing a synthesis of form and content in processing data. McCarty equates data with objects of study, historical texts and artefacts for example. McCarty argues that the analysis and synthesis of form and content underpinning cultural artefacts is of key importance in comprehending what new learning DH offers, rather than seeing form and content as separate qualities of an artefact:

By analysis I mean figuring out how something works by taking it apart, for example when a literary critic dissects a poem to understand how it does what it does, or when an historian picks apart items in an Archive... By synthesis I mean not only what both critic and historian do when writing their books but also the invention of forms, methods and genres that create new understanding of a subject and make possible new forms of expression (2007, p.9).

The differences between analysis and synthesis and the relevance of McCarty’s synthetic research methodology are important for the I-Ulysses project. Kirshenbaum’s argument, like McCarty and Svenson’s, focuses on New Media offering possibilities for the study and analysis of content. Kirshenbaum sees these New Media not just as tools for implementing other types of content but as cultural objects. Kirshenbaum defines synthesis as being the use of these media, focusing on the ways they can convey particular types of content in unique formats; this is one of the central objectives of the I-Ulysses project which adapts the unique content of Ulysses in an innovative digital format.
Kirshenbaum sees the formats themselves as unique, as cultural objects, rather than as a means to host or disseminate other types of information. The format of the data becomes more important in the analysis of digital media as it can communicate more through the medium than the content that was originally intended to be conveyed. This is what McCarty and Kirshenbaum mean by synthesis: combining the form of conveyance into the content itself. As noted in the introductory section, in this ‘Review’ a link will be formed between the areas of Electronic Joyce Studies and Digital Humanities. This link is established through discussing and connecting the format of Joyce’s work, with its narrative tropes and storytelling devices, with the unique potential for conveyance that Digital Media enables.

As part of this connection, the historical relationship between Joyce Studies and Hypertext Studies will be developed in subsequent sections. Studies of *Ulysses’* composition will be noted to highlight the main theoretical issues that Joyce Studies is concerned with and why they are of relevance to this project. A central research objective of the ‘Review’ will be to establish links between Joyce Studies, Hypertext Studies and Digital Media Studies in a way that is relevant to the content of Joyce’s work. These links will be further discussed after the practical ‘Case Studies’ that follow. The technical resources employed in the research will be discussed in the ‘New Studies’ chapter. A brief introduction is given in the ‘Review,’ with the aim of connecting the storytelling and narrative tropes of *Ulysses* with the discussion of game development media and virtual
reality that follows in the ‘New Studies’ chapter.

2.5 Case Studies

In recent years several projects have used digital technology to provide guides to Joyce’s work. Ian Gunn’s 7 Eccles Street, The Buffalo Archive and Jo Nugent’s Ulysses i-phone app are three such projects. The most prominent Digital Companion to a literary text is the Wasteland phone-app developed by Faber and Faber and TouchPress Media. Jo Nugent has developed an app for Ulysses, which follows the design of the Wasteland app. These projects, amongst others, will be discussed as ‘Case Studies.’

This section of the ‘Review’ will demonstrate the significance of digital technologies in rendering Ulysses easier to understand. This section of the ‘Review’ will look at several projects that use multi-media and ICT tools to explore narrative concepts from literature. These examples are used to make comparisons with the I-Ulysses project, reflecting and developing on such techniques and tools and building a native learning environment for Joyce’s work (following on from the discussion of Svenson, McCarty, Hockey and Kirshenbaum et al).

The first section of the chapter introduces the narrative and storytelling devices e-learning resources can enable, with specific focus on narrative multi-linearity. In this section a history of games, Gamebooks and E-Books is provided and the
employment of multi-linear narrative paths is discussed. The I-Ulysses project creates a multi-linear experience of Joyce’s *Ulysses*, connecting the nodes of Joyce’s narrative in a hypertextual format. This results in a series of interactive paths that a user can follow. These techniques will be further discussed and elaborated on in the ‘Methodological Contexts’ chapter.

The first examples discussed here will be commercial games. The commercial bias of the games industry has resulted in a paucity of literary games or games that are based on literary works. There are games that explore philosophical or literary themes, but there are very few that are based on actual books. In some cases there are updates for games that adapt scenarios from literary works. These adaptations are fan-made and take imagery and elements from novels and then develop them into game content using the source code of another game. Usually the code used in these projects is not original but relies on the source code of another game, because developing game media is time and labour intensive. Examples of these games include the *Command and Conquer* version of *War and Peace* and a *Minecraft, Thief* and *Second Life* version for *Anna Karenina* among other literary works. Recently, a game version of F. Scott Fitzgerald’s *The Great Gatsby* was released based on a mod of an 8-bit *SNES* platform game. A screenshot of the game is seen in Fig 2.4.
A more recent version of Gatsby was developed by Sab games, which follows the point-and-click format of the adventure game genre like Professor Layton’s Mystery series, available for the Nintendo DS and iPhone (see Fig 2.5). Game literary adaptations reuse literary motifs which readers of the books may be familiar with. For example the Gatsby games do not remediate content from the book, respecting the design techniques that game development media such as an engine like Unity enables, but instead rely on pre-existing game formats to tell the story.
In the 1970s an adventure game based on J.R.R. Tolkien’s *The Lord of the Rings* was released. This game featured a multiple choice style adventure format and was followed by several short-lived imitations: Scott Adam’s *AdventureLand* (1978) and Patricia and Willie Crothers’ and Don Woods’ *Colossal Caves* (1977). Multiple choice game adventures use a format where different screens load up depending on player choice. The earliest computer program to use this style of Interactive Text format was psychologist B.F. Skinner's programmed learning book *Doubleday's Interactive Tutor Text*. Skinner described the format as, “a method of self-instruction that enlists machines or specially prepared books to teach information” (1995, p.505). These interactive texts provide extensible multiple-choice quiz questions, with a correct answer sending the user forward in the text, while an incorrect answer sends the user to a page explaining why the user was wrong. Skinner describes the format of the book:

Students choose from multiple-choice answers and then are prompted to proceed to another page of the book depending on their answer. If a correct answer is given, students move on to another page with more information to learn and more questions to answer. An incorrect answer leads to comments on why the answer is incorrect and a direction to return to the original question to make another selection (p.506).

The multiple-choice adventure game format developed from the genre of
Adventure Books, which allowed readers to flip forwards in the book to discover if certain actions would result in their death or progress. This was a genre of popular fiction that became successful in the 1970's and was popularized by Edward Packard and R.A. Montgomery in the Gamebook genre and the *Choose Your Own Adventure* series published by Bantam Books. Packard and Montgomery introduced novel multi-linear narrative techniques, endless page loops and trick endings, with readings having many possible outcomes.

Packard notes how in conventional children’s literature, there is a sense of character’s behaviors being rewarded in simplistic ways; moral decisions leading to progress and immoral choices leading to failure. In the Gamebook genre Packard and Montgomery wanted to indicate life was not so black-and-white, "my intent was to try to make it like life as much as possible," Packard states, continuing:

I didn't want it to be a random lottery but I didn't want it to be didactic so that if you always did the smart thing you always succeeded. I tried to balance it. There's no way we could have programmed a moral ending for every story line: life isn't that way. *Choose Your Own Adventure* is not that way. *Choose Your Own Adventure* is a simulation that approximates the choices that we face in our lives (2007).

The Gamebook genre of Packard and Montgomery is now being developed into apps for the *iPhone* and *iPod*. In the app the E-Book user experiences added special effects; they encounter a wide range of characters and explore virtually immersive environments. While not strictly being games they are a combination
of E-Book and the Adventure Game format. The E-Book format uses the same type of technical set up as the Digital Companion format, while employing traditional spatial, gaming elements.

Perhaps the most successful example of a Digital Companion is the *Wasteland* phone app developed by *Random House Ltd*. The phone app provides the user with the text in a hyperlinked format, along with critical readings and embedded media. As the user reads the text they can consult the linked information; interviews with scholars and readings of the poem correspond to the point in the text that the user is at. This allows a side-by-side reading of the text with its supporting materials.

The manner in which *The Wasteland* app’s hyperlinked materials are presented is contrasted with readings of the original text. Additional meaning is enabled through this contrast of aural, visual and hyperlinked information. The app provides critical readings of the poem and puts particular emphasis on the areas of the poem where there are divergent critical interpretations of events or meanings. This format builds a contextual bridge for the user (see [Fig 2.6](#) for a screenshot of the ‘Death by Water’ segment, being read by Fiona Shaw). The Digital Companion format facilitates the many ways a reader might interpret the content of *The Wasteland* and anticipates their choices in a real time.
There are currently no video games designed to act as Game Companions to specific books, however the versatility of game development media can allow a user to explore many facets and themes from a book in a real-time spatial environment. Like the *Wasteland app* a game could provide added content and media through specific events and readings, but with the added element of realistic spatial and audio dimensions. There are several games that place an emphasis on spatial learning, but the games industry does not make commercial games with a meaningful learning focus (Dondlingler, 2007, p. 26).
Games have employed models that use a player’s spatial reasoning faculties to challenge how they think about conventional space, but nothing has tried to integrate this meaningfully with the themes of a conventional narrative that has the density of a book (Salen and Zimmerman, 2004, p.578-79). Games like Soul Reaver and Portal tie complex deforming-geometry algorithms to a player’s successful completion of game objectives, incentivizing them to complete the game and gain access to new spatial dimensions. Thief and Mist have built multi-linear stories with impressive use of visuals and sound, creating immersive virtual worlds. These games have utilized higher narrative and spatial functionalities, but they do not do so in a way that has a quantifiable learning goal.

Audiovisual Adaptations of Joyce’s Work

This section will look at a variety of multi-media adaptations of Joyce’s works, exploring several specific audiovisual formats: films, websites, CD-ROMs, virtual reality and i-phone apps. The first area discussed will be film adaptations of Joyce. The second topic will be websites that explore Joyce in a hypertext format. The third and final topic will be e-readers, Digital Companions, apps, CD-ROMs and the E-Book formats for reading Joyce’s work on the i-phone, Android or with other digital devices.

Joyce’s writing is noted to have cinematic qualities. Harry Levin in James Joyce: a Critical Introduction described Bloom’s mind as a, “motion picture cut and edited to emphasize close-ups and fade-outs of flickering emotion, the angles of observation
and the flash-back of reminiscence” (1960, p.88). Levin noted that the writing style of Joyce closely resembled the cinematic techniques of montage and that, “in its intimacy and its continuity, *Ulysses* has more in common with cinema than other literature” (ibid). Edward Murray in his review of Strick’s adaptation of *Ulysses* outlines the reasons why a successful film adaptation of Joyce’s work remains elusive. Murray notes that the main failure of Strick is in his rendering of Joyce’s interior monologue narrative technique:

The attempt to make a movie version of *Ulysses* was doomed to failure. Although Joyce’s novel is full of techniques comparable to those employed on the screen, the techniques are verbalized in the book or exercised at a linguistic-intellectual level beyond the capacity of a movie camera to record. Unless we get inside the mind (deep inside the mind) of Joyce’s characters we do not know them. Cinema is unsurpassed at rendering the surfaces of things; when required to penetrate the complex psyche of a character, however, it is sadly inferior to what can be done by the stream-of-consciousness novelist (2002, p.127).

Murray makes the point that conventional cinematic storytelling techniques are not compatible with Joyce’s work; the realization of his character’s imagination in a wider context requires more space than can be fit in the space of a two-hour feature film. Murray argues that this is evident in Strick’s *Ulysses* and later in *Portrait of an Artist* (1979). Murray notes that there are several non-feature film adaptations of Joyce’s work. One example is Mary Ellen Bute’s *Passages from Finnegans Wake* (1965), a series of animated shorts based on stories from the novel. Recently an Irish film inspired by aspects of *Finnegans Wake* was directed by Padraig Trehy:
Shem the Penman Sings Again (2015). Like Bute and other noted examples Trehy’s film is episodic in structure; he did not reproduce Finnegans Wake completely, but rather he created specific vignettes inspired by the work.

In Strick’s version of Ulysses he organizes the story of the film around the book’s episodic structure; where the main sections of the book, structured around the meeting of the two central characters, are featured heavily. Strick’s script juxtaposes the events of the first three chapters, dealing with the experience of the two main characters (Bloom and Stephen) and then subsequently lays their respective episodes out side-by-side. In doing this, Strick alters the structure of the original book in order to focus in on the specific story paths of Bloom and Stephen. In the book their sections do not happen simultaneously, but rather one after the other with the reader being introduced to Stephen and then following on to Bloom.

Strick uses the above technique in order to simplify the story of the novel and connect the experiences of Bloom and Stephen to make their relationship more
central to the opening segments of *Ulysses*. After setting up the relationship between the two characters, the film progresses to several vignettes and set-pieces taken from the book. Strick adapts some of the more abstract storytelling techniques of *Ulysses* in a way that still has a conventional film-narrative, in the meeting of Bloom and Stephen, but that is not slowed down in exploring the many subplots that Joyce fills the book with. As Murray states the ability to get inside the character’s mind is what makes Joyce’s work so distinctive. In essence this is the ability to focus on fine details and subplots, which is the reason Murray considers Strick’s film a failure.

The failure of a film adaptation of the work of Joyce is notable, given that several of his literary techniques would appear to function well in a film format; specifically the use of the interior monologue technique. Joyce influenced in a direct way, to varying degrees of success, Italian ‘Neo-Realist’ filmmakers and the French ‘New Wave;’ it is surprising therefore that more has not been made of the relationship between Joyce, Cinema and the interior monologue. The more episodically driven format of contemporary films, with a less strict focus on specificity of time and place and the ability to move between different stories and characters would seem to fit the structure of Joyce’s works.

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4 While the relationship and eventual meeting between Stephen Dedalus and Leopold Bloom is a pivotal part of the book, the version of the events that Strick presents makes the relationship more foregrounded. In the book the wider canvas allows Joyce to set up the eventual meeting by connecting together a larger number of characters’ stories and giving hints to the reader as to what will happen.

5 At the time of writing there is only one book that has collected and edited together numerous essays written on the topic of Joyce and cinema. John McCourt’s *Roll Away the Reel World* includes essays on Joyce’s relationship with Eisenstein, his failed attempt at establishing the first cinema in Ireland, *The Volta*, and the influence of early modern and avant-garde cinema on Joyce.
In terms of the *I-Ulysses* project there are several aspects of Joyce’s work, such as the interior monologue technique, that make the process of remediating the novel into a digital format specifically different from what has been done with the film versions. In the preceding discussion, the notion of focusing in on small or fine details was noted; with a digital version of the story it becomes possible to include biographical information and Joycean references to obscure passages from the text without disrupting the flow of the story. By making the experience interactive, a user can take the time to focus in on specific details and will be given different content to explore. In a virtual version the added spatial component of the experience connects specific facets and story arcs from the text to specific spaces from the novel and the story. In this regard, digital technology and game development media can enables perspectives on Joyce’s work that cinematic adaptation cannot.

**Websites**

Since the late 1990’s a number of websites have been developed with the intention of exploring Joyce’s work in a hypermediated format.\(^6\) The most well-known of these is Michael Groden’s *Notes on Ulysses* which currently exists as a subdomain of the University of Ontario website. It was originally intended to be hosted as an independent domain that would be continually updated by Groden, his students and the administrators of *The Buffalo Archive*; however the project did not develop to a further stage. Groden’s *Notes* still provides a useful online resource because it

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\(^6\) Hypermedia means hyperlinked information and embedded media.
condenses the narrative of Joyce’s *Ulysses* into relevant themes, concepts and motifs like Gilbert’s *Schema*, but in an interactive format. Each webpage contains one episode of *Ulysses* and has six linked web pages broken down into the headings: Characters, Location, Time, Thoughts and Questions.

Jorn Barger’s website *Robot Wisdom* provides a similar interface to that of Groden’s; it provides linked web pages and also provides the user with real-time links to text, images, advertising, songs and paintings featured in Joyce’s work. Barger relates the textual aspects of Joyce’s work to technical aspects of computer programming and artificial intelligence, particularly the notion of *hypostasis*. Barger argues that modern software development is built to provide pre-defined bundles, or modules of information, which translate to processors making applications run. He calls this a hypostasis effect, though the term does have a similar meaning in Computer Science and Barger did not invent it. Barger’s hypostasis is an effect where linked digital information can disseminate through predefined networks, whilst also propagating larger networks. Barger argues that these larger networks act as a self-perpetuating system; he argues that *Ulysses* is structured in a similar manner, where facets of the text are invested with latent meaning and can form additional meanings when the reader becomes aware of their significance.

The website *Joyce in Images* was developed by Aida Yared and Andrew Badr. The site has arranged the episodes of *Ulysses* (‘Telemachus,’ ‘Proteus,’ ‘Nausikaa’ etc.) in order with an accompanying set of quotes from each chapter and images, such as photographs or paintings taken from the period, next to each quote or extract (see
Fig 2.9 and 2.10 below). The images and quotes tell a visualized story of each chapter and draw the user further into the cultural material of *Ulysses*; they also make effective use of visual puns. The format of the text and images fulfills a further function, in that it gives clues to the viewer as to what may have inspired Joyce to include certain visual references or advertisements in *Ulysses*.

As has been seen with the hyperlinked format of websites such as *Robot Wisdom*, *Notes on Ulysses* and *Joyce in Images* and with the possibility for embedded media, the website format offers a useful means to disseminate and discuss Joyce’s main works. The main technique that the webpage format approximates is the use of the hyperlinked (or hypostasis) format; however the website format does not enable an interactive, virtual experience of the book and this is a format that will be looked at next.
Fig 2.9 and 2.10 Images from the *Joyce in Images* website (on the left is a map of Dublin and on the right an image of the opening of a mass that accompanies Mulligan’s “Introibo ad Altare Dei”)

**Virtual Reality**

The main project that explores Joyce’s work in a virtual context is the *Dubliner’s Online Resource*. The combined resources of UCD, TCD and an independent digital production company came together to create the *Online Dubliners Learning Resource* also referred to as the *Inside Joycean Dublin* project. The resource depicts Joyce’s Dublin from the short story ‘Two Gallants’ and rebuilds the Dublin of pre-1916. Terrence Killeen, an independent scholar and trustee of the James Joyce Centre, is working on the Joyce related content, while the project is being produced by Ed Mulhall of RTE’s *News and Current Affairs* department. The computer graphics department of TCD GV-2, led by Dr. John Dingliana, has been developing the
graphical content. Contributions to the project have been made by the independent digital media production companies *Big Top Media* and *NOHO*. A second Joyce project that uses virtual reality is Ian Gunn’s *7 Eccles Street* (see Fig 2.11), here Gunn creates a replica of the Blooms’ house and the viewer in the demonstration video follows Bloom’s path over the railings in ‘Ithaca.’

![Image: The house of the Blooms': 7 Eccles Street](image)

**Fig 2.11** The house of the Blooms’: *7 Eccles Street*

The author had the opportunity to work on the *Inside Joycean Dublin* project over an extended academic placement lasting several months; his contribution was in exporting the 3-D assets, rendered by *NOHO*, into the *Unity* game engine. The *Inside Joycean Dublin* learning environment is a model of Joyce’s Dublin circa 1904. The prototype model comes with biographical and geographical references, citations, readings, maps and music featured in the episode. This model is aiming to highlight the architectural differences between pre and post-1916 Dublin. The project has been developed along concurrent lines as a virtual learning project and also a restorative heritage project. The author’s contribution to the project was to make it more interactive and game-like by providing a character avatar and developing goals...
and objectives for the user to follow in the environment (see Fig 2.12).

**Fig 2.12** A map with themes and an overview of the city from *Inside Joycean Dublin*

As can be seen in the examples of the *Inside Joycean Dublin* project and Ian Gunn’s 7 Eccles Street, virtual reality is a relatively new and unexplored territory for Joyce. In both projects the primary interests and involvement of technological expertise came from an architectural or heritage basis, rather than having an explicit emphasis on the design and story of graphical assets employed. In other words, there was less of an interest in representing the story of *Ulysses* in a spatial or temporal sense with computer graphics; this consideration took second place to the architectural and heritage focus.\(^7\) The unique spatial affordances that computer graphics allow in

\(^7\) The author can attest that encouraging tourism and developing the architectural appearance of
representing the story and spatial dimensions of the book are areas that have never been explored on their own merit; the I-Ulysses project aims to break new ground in this regard, with the use of innovative game development media and the Unity engine.

E-Books, Digital Companions and CD-ROMS

The Finnegans Wake Explorer is an E-CD developed by Tim Ahern and published by AFI Productions. It was a project that aimed to create an interactive learning app for Joyce’s Finnegans Wake. It was produced as a series of animated shorts based on episodes from the novel; however the project did not progress due to a lack of funding. There also have been a number of Digital Companions to Joyce’s texts. After the tremendous commercial success of the Wasteland i-phone app several similar projects were proposed to create companions to Ulysses. Like the Joycean Dublin resource the impetus for these projects came from tourism; the objective was to enable users to be able to explore Dublin while consulting an app, creating an interactive walking tour. The most successful of these projects is Jo Nugent’s JoyceWays, developed with assistance from his students in Buffalo University. Nugent has developed two apps, one for Joyce’s Dubliners (see Fig 2.13) and one for Ulysses (see Fig 2.14), the Ulysses app being a walking-tour guide and the Dubliners app being an e-reader for Joyce’s Dubliners.

Dublin pre-1916 was a key design element of the Inside Joycean Dublin project.
E-Books of *Ulysses* have been published by *Hongshee Software* as a Google+ app and by *Naxos Books* as an e-reader (see *Fig 2.15* and *Fig 2.16*). These E-Books are valuable resources, providing readers with the text of *Ulysses* in a hyperlinked format, along with critical readings, creative interpretations, maps, illustrations and music. As the user reads the text they can consult linked contextual information, interviews with scholars and readings of the book which correspond to the point in the book that the user is at (see *Fig 2.17*). This allows for side-by-side reading of the text with its supporting materials and is more interactive than a conventional text-based guide to the book.

By having notes that can be read in conjunction with the text, this allows the user to
pause the Companion at any point and focus in on specific details, the fine or small
details, that Joyce presents to a reader in *Ulysses*. In this way, the reader can choose
specific details or paths to follow through a metatextual blueprint of *Ulysses* without
disrupting the narrative flow of the book. This added dimension of contextual
meaning that the Digital Companion format layers over a conventional reading of
the text makes the digital format both an indispensable guide to the book and a
unique e-reading experience itself. What the Digital Companion format traditionally
lacks is an elaborate graphical interface for the user; the *I-Ulysses* project aims to
provide this interface with 3-D graphics that emphasize some of the audio-spatial
qualities of Joyce’s work.
Mr Leopold Bloom ate with relish the inner organs of beasts and fowls. He liked thick giblet soup, nutty gizzards, a stuffed roast heart, liver slices fried with croutons, frieze hencods’ roes. Most of all he liked grilled mutton kidneys which gave to his palate a fine tang of faintly scented urine.

Kidneys were in his mind as he moved about the kitchen softly, righting her breakfast things on the humpy tray. Gelid light and air were in the kitchen but out of doors gentle summer morning everywhere. Made him feel a bit peckish.

The oaks were reddening.

Another slice of bread and butter: three, four: right. She didn’t like her plate full. Right. He turned from the tray, lifted the kettle off the hob and set it sideways on the fire. It sat there, dull and squat, its spout stuck out. Cup of tea soon. Good. Mouth dry. The cat walked stiffly round a leg of the table with tail on high.

—Mkgnao!

—O, there you are, Mr Bloom said, turning from the fire.

The cat mewed in answer and stalked again stiffly round a leg of the table, mewling. Just how she strolls up my waiting table, poor, sappy mackerel. Poor.


Fig 2.15 Hongshee E-Book and Fig 2.16 Naxos Ulysses Phone App

Fig 2.17 Naxos Phone app guide to Ulysses, this section focusing on ‘Calypso’
Mathew Berry and Josh Levitas have created an interactive graphic novel adaptation of *Ulysses* based on the two chapters ‘Calypso’ and ‘Telemachus’. These chapters deal with the two central characters’ first appearances in the book. This project is entitled *Ulysses Seen* (see Fig 2.18). Berry has used the graphic novel medium as a way to connect some of the visual motifs in *Ulysses*. The graphic novel features thought bubbles that delineate a character’s thoughts and spoken words in the text. The graphic novel format has been designed for reading in an *I-phone* format, as the user can stop to consult relevant contextual information and differing interpretations of the same events, they can also see the creative decisions that were taken in its development.

![Fig 2.18 Ulysses Seen](image)
The *Ulysses Seen* project is important because it offers a visualized experience of Joyce’s works that combines some of the features of the Companion format with enhanced artistic and stylized imagery. With digital technology it is possible to provide a user with a multi-linear, immersive experience of *Ulysses*, rather than focusing on only a single facet of the text. The *I-Ulysses* project aims to take this type of work a step further in using game development media to both visualize and spatialize the experience of the book, connecting key themes of the novel to specific spaces and places, whilst retaining and enhancing the aural and acoustical qualities inherent in Joyce’s writing. In this respect the virtual reality format of the *I-Ulysses* project is perhaps the closest approximation to a perceptually realistic experience of Joyce’s writing that is possible in any media (including the digital format), with its ability to engage a user in the content and context of the novel on separate and simultaneous levels.

In addition to the Digital Companion and E-Book formats another e-learning format researched in this project is *RIN*. *RIN, or Rich Interactive Narrative*, is a software developed by Curtis Wong of Microsoft’s *Research and Development Division*. The concept behind *RIN* involves the embedding and hosting of different types of audio-visual material in a single interactive format. The *RIN* technology explores the structuring of conventional narrative formats, such as stories, documentaries and art installations, which may have spatial, audio and animation components.⁸

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⁸ The author had the opportunity to attend a workshop given by Mr Wong where he gave attendees access to a Beta version of the software.
**RIN** is a Microsoft application that uses sophisticated API\(^9\) to keep all media files hosted in a single remote, server-based location. Currently the **RIN** website hosts some examples of how the software has been used; the example below shows a project exploring the acoustics of a Baroque organ (see *Fig 2.19*). The system relies on .XML to allow a user to make limited changes to the interface and to embed more sophisticated applications in the **RIN** timeline that do not require extensive authoring, such as animation and use of spatial audio. **RIN** would benefit a tutor employing an online teaching curriculum because they, or their students, could regularly access and update its format.

![RIN screenshot](image)

*Fig 2.19* **RIN** or Rich Interactive Narrative (2012, **RIN**: A Declarative Specification for Interactive Narratives over Rich Media)

### 2.5 Joyce Studies and Hypertext

Adapting *Ulysses* into a virtual environment provides a significant opportunity for

\(^9\) Application Programming Interface
multi-media research. The hypertextual format of digital media complements the wide-ranging nature of Joyce Studies due to its presence in painting, music, art and film. Michael Groden, Hans-Walter Gabler and David Hayman argue that the study of *Ulysses* lends itself to hypertext (Groden, 2001, p. 361). With the means to hyper-mediate the text format it becomes possible to experience *Ulysses* in a manner that, Groden argues, is closer to how Joyce had intended. The Digital Humanities can mediate and counterpoint Joyce’s work in a manner that enhances its understanding in the context of the book, whilst enabling new humanities research.

In this section some essays on Joyce’s work in literary and cultural theory will be examined. The links between Joyce Studies and Hypermedia will be developed further from what was discussed in the preceding sections. In his Introduction to the *Cambridge Companion to Joyce* Derek Attridge implies that through a process of cultural percolation, “we are all indirectly reading Joyce in contemporary popular culture and literature and that, for this reason, it is impossible to read Joyce for the first time” (1990, p.2). Attridge states that it is difficult to ascertain which of Joyce’s secondary literature can be considered in or outside the text, given the wide-ranging nature of his influence.

The work of any critic or theorist of Joyce requires serious effort in consolidating Joyce’s books, their film and stage adaptations and the critical analysis of his work into a single comprehensive account. Joyce was noted for having an eclectic awareness of a diverse range of subjects: advertising, consumer-culture, film,
music and popular culture. In these subjects his name is often mentioned but the context of his works is rarely given in the original sense of the work being cited. Cultural Theory and post-modernity is sometimes read as a companion to Joyce Studies.

2.6 New Media

The main area where Digital Media allows new perspectives on Joyce, which are distinct from for example cinema, is in the realization of what was referred to previously in the film section as fine or small details. The discussion of Digital Media has been further developed in the discussion of the Digital Companion, video game and website formats, in the Wasteland phone-app and the narrative potentials of game development media. The section that follows will include the ideas of Lev Manovich and Marshall McLuhan and specifically relate them to the use of virtual reality and the design of Human Computer Interface (HCI), which will then be developed further in the discussion of game development media.

In short, it was concluded in the previous sections that the ability to focus in on one specific facet, or fine detail, of *Ulysses* at a time without disrupting the overall flow of its narrative was an area where Digital Media could offer new perspectives on Joyce. In the following sections the significance of Digital Media will be noted and the new contributions that the *I-Ulysses* project will enable, in terms of adding a further spatial and aural layer to the reader’s engagement, will be introduced.
Lev Manovich and Marshall McLuhan are primary sources in this section of the review: both are considered founders of Digital Media and New Media Studies. McLuhan notes how the spoken word is the predominant form of communication in contemporary electronic media, such as television, radio and cinema. This multi-media revolution, he argues, has overshadowed the print medium. He calls for a dramatic review of narrative tropes, semantics and ontology in this new interactive context. For McLuhan interactivity represents the interplay of several senses and media at one time:

In this electric age we see ourselves being translated more and more into the form of information...Our very word grasp or apprehension points to the process of getting at one thing through another, of handling and sensing many facets at a time through more than one sense at a time (1994, p.89).

McLuhan argues that New Media combines or enmeshes narrative meaning in a variety of new forms and genres. McLuhan sees New Media as representing the splitting and recombining of traditional narrative modes. Derek Attridge states:

we encounter the effects of Joyce’s revolution every week, if not every day, in television and video, film, popular music and advertising, all of which are marked as modern genres by the use of Joycean techniques of parody and pastiche, self-referencing, fragmentation of word and image, open-ended narrative, and multiple points-of-view (1990, p.1).

As Joyce is seen by Attridge to be a spiritual predecessor of post-modernity, so
too can he be seen as a predecessor of New Media. Joyce’s fascination with the media of his day, his attempts both to include film and radio styles in his writings, and to establish and promote Dublin’s first cinema would indicate that his interest was more than superficial. Joyce had considered the narrative implications of New Media half a century before McLuhan and he was fascinated by the ways that these media could tell new stories. He was particularly interested in their potential to facilitate and propagate the spoken as opposed to written word. *Ulysses* is a book that Joyce had intended to be read aloud (Attridge, Kenner and Fritz Senn et al.).

Joyce’s relationship with and interest in technology, in both the cinematic medium and audio-recording, is another area that scholars have discussed extensively. Sara Danius in her book *The Senses of Modernism* looks at the ways that traditional understandings of social, sensory and spatio-temporal identity were challenged in the early modern period by technological developments in cinema, photography and sound recording. In the fourth chapter of her book she focuses on Joyce’s *Ulysses*, arguing that Joyce’s work, “is a Modernist monument to the eye and ear” (2002, p.149). Similar to how McLuhan describes the phenomenon of splitting or the recombining of sensory apparatus in the digital age, Danius argues that Joyce’s Modernist epic represents, “an index and an enactment of the increasing differentiation of the senses, particularly sight and hearing” (ibid).

With virtual reality one of the central possibilities offered by the medium is the
organizing of a sequence of audio-visual tropes into what are called story cues; a means by which to progress the story and enhance the sense of immersion through a combined, multi-sensory apparatus. Danius connects her discussion of the refraction or dislocation of the sense apparatus in response to cinema and audio-recording, with profound changes in the social and public spheres of the early modern period. It is interesting in this context to consider what revolutions are enabled by the equivalent innovations of the video game and virtual reality mediums and what this entails for Joyce, given his relationship with technology and Modernism. Danius credits Joyce, along with Proust, as being one of the original writers of the modern era to chart the changes in aesthetic perception and to relate them to the wider social, historical and political landscapes of the time.

Danius describes how the greatest challenge of her chapter in the book was to show how, “Ulysses registers the social history of that interface between the world and embodied individual known as the sensorium” (p.151). From Danius’ perspective, Joyce did more in Ulysses than just create an environment; he built a world that could support the materiality and motives of his characters. In this way, the world of Joyce is an immersive environment and games also use the quality of immersion to create meaningful narrative experiences for players. This quality of immersion and the narrative potentials of game development media will be further discussed in the ‘New Studies’ and ‘Methodological Contexts’ chapters.

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10 Danius discusses the phone conversations in Proust’s A la Recherche and Joyce’s Ulysses as being of great significance.
David Jay Bolter in his book *Understanding New Media* charts the dramatic shift from printed formats to electronic media. Bolter’s focus is on how the materiality of the text is altered by its electronic remediation (2001, p.21). He sees a shift towards New Media engendering challenges not just to the primacy of the text but also as a way to communicate facets of meaning within the text, using different embedded electronic media. Bolter’s argument is that the text itself is a code that when unlocked yields meaning (p.22). He argues that New Media presents the user with a similar set of codes, which when unlocked yield new knowledge of the texts they remediate. Bolter, like Groden, has described *Ulysses* as a candidate for hypertext adaptation, calling *Ulysses*: “a hypertext that has been flattened out to fit on the printed page” (Bolter, 2001, *Electronic Writing Space*, p.111). Bolter gives an overview of the dramatic remediation of digital technologies:

> Digital technology is turning out to be one of the more traumatic *remediations* in the history of Western writing...digital technology changes the look and feel of writing. It modifies not only the technology for reproduction of the text, but even the *materiality* of the object that communicates the text to readers...computers have been recognized not only as tools for writing, but as media for popular entertainment and expression, which we are using to refashion visual as well as verbal communication...remediation is not thus limited to technologies of writing. (p. 24).

Much as Bolter notes how the materiality of text is challenged by remediation, Lev Manovich has looked at how traditional narrative tropes and media are challenged by remediating stories into the spatial and temporal formats of
Manovich argues that the predominant visual cultures of the twentieth-century are cinema, television and photography and that these too, like print before them, will undergo dramatic transformations in the digital age. Manovich discusses how traditional filmmaking techniques, montage specifically, enforces an artificial relationship between space, time and narrative. Now with the use of computer graphics these conventions can be rendered abstractly without the need for a pre-existent physical space:

Spatial montage (meaning computer graphics) represents an alternative to traditional cinematic temporal montage, replacing its traditional sequential mode with a spatial one... speaking of the cinematic method the same principle of Ford’s production line made computer programming possible: a computer program breaks a task into a series of elemental operations to be executed one at a time. Cinema followed this logic of industrial production as well. It replaced all other modes of narration with a sequential narrative, an assembly line of shots that appear on the screen one at a time...this type of narrative turned out to be particularly incompatible with spatial narrative (2001, p.18).

As Manovich notes computer graphics offer interesting possibilities for new kinds of, in his words, “spatial narrative.” The game medium employs the use of these spatial narrative tropes. With a video game, narrative is not constrained by the limitations of the designer’s imagination, as users both participate in and create their own narrative experiences by playing the game and engendering the role of player, or participant in their own narrative. Additionally, the remediation of Joyce’s work into a format where sound and space can be juxtaposed is a key
area that the *I-Ulysses* project explores, in respect of the aesthetic affordances that game development media can provide.

Ultimately the project is about employing these techniques in a way that draws the user into an experience of *Ulysses*, in which they feel that they are enacting a narrative and have an influence over or are responding to these “tropes of sight, space and sound.” (Danius, 2002, p.149). In this way the environment seeks to join the experience of the user to layers of connected meanings, or the hypertextual elements of Joyce’s work, by embedding these hyperlinks in an aesthetic framework of sight and sound. This framework will reflect what Joyce attempted in *Ulysses*; the fracturing and recombining of different types of audible and visual information embedded within a thesis or higher context of meaning that supports its own materiality, or multi-linearity, and immerses the user in an interactive virtual reality experience. In this respect, the project is not rewriting, or re-conceptualizing work that has been already been done in the area of Joyce Studies, in terms of identifying key presences or new research areas. Instead, the project is offering a template by which a user can see these distinctive storytelling techniques represented in a format that renders the techniques in Joyce’s text.

The multi-faceted and multi-sensory aspects of New Media discussed in Manovich, Bolter, Danius and McLuhan will be meshed into the discussion of multi-modality and multi-linearity in the ‘New Studies’ and ‘Methodological Contexts’ chapters. A multi-modal setting is one where several kinds of visual,
aural and audio information are presented to a user in seamless continuity. Multi-modality is a focus of discussion in Virtual Reality Studies and for the purpose of adding research value to the I-Ulysses project the thesis will draw links in the ‘New Studies’ and ‘Methodological Contexts’ chapters between multi-modality and aspects of New Media studies discussed in the ‘Review.’

**2.7 The Cracked Looking Glass**

The diffusion of Joyce-related material makes Joyce Studies an undulating landscape of secondary material. In studying Joyce’s attitude towards Irish nationalism, for example, sources identify him both as a champion of Irish and Dublin culture while also an exile from his home. In his attitude towards Catholicism sources vacillate, seeing Joyce either as mildly intolerant or agnostic to being an assertive opponent of organized religion. (Attridge, 1990, p.23). This diffusion or variance is also what makes Joyce’s attitudes and work difficult to assess and, as Attridge argues, it is reflecting the structural and stylistic divisions of the text.

Attridge states that, “the metatextual mountain of Joyce criticism is not in any simple way outside of Joyce’s writing.” (1990, p.24). Attridge notes that the textual mountain of *Ulysses* criticism in Joyce’s secondary materials has expanded the context of the original work, “dilating it to many times the size of the

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11 Seamus Deane argues that it is only when Joyce leaves Ireland that he is able to undergo a creative renaissance, writing both *Dubliners* and *Ulysses*. These works, particularly *Ulysses*, form a topographical chart of Dublin geography, to such an extent that, “if it were burned to the ground, the pages of *Ulysses* could be used as a blueprint to rebuild it” (Budgen, 1990, p.51).
original” (ibid). The “growing out of” or “overdevelopment” of Joyce’s narrative is linked to a common difficulty in reviewing the critical discourse surrounding the text. (Osteen, 1995, p.29). The narrative structure of the novel is very different from conventional narrative structures. There are different ‘presences’ or ‘voices’ that are used to convey distinctive storytelling techniques at specific points in the text. (p.45).

Confusion between the presences is what causes problems for the first-time reader and may create issues in reviewing Joyce’s secondary sources. The presences are: the narrator, the speaker and the interior monologue. The latter presence establishes the tesseract format of *Ulysses*, deriving a complex interplay of singular voices within the overall narrative. The distinction is further complicated by the division of the book into two segments or ‘styles,’ what Joyce referred to as the ‘initial style’ and ‘latter styles;’ the split occurring in the ninth chapter (Groden, 1977, p.15).12 Shortly after the publication of *Ulysses* a number of accounts sought to explain the book to catalogue a relational index between the ‘voices’ of the book, specifically the styles, narration, characters and interior monologue technique.13

12 Joyce writing to Harriet Weaver Shaw:

> I understand that you may begin to regard the various styles of the episodes with dismay and prefer the initial style, much as the wanderer did who longed for the rocks of Ithaca. But in the compass of one day to compress all these wanderings and clothe them in the form of this day is for me possible by such variation which, I beg you to believe, is not capricious. (*Letters 1*, 129).

13 The Gilbert Schema, discussed in the ‘Introduction’ chapter, is an example of one such attempt to break the book down into separate themes or subdivisions.
Structuralist accounts of the text explain that each chapter of *Ulysses* has its own style, technique and theme. Structuralists emphasize that within this narrative framework the characters, voices and settings are embedded as nodes or juncture points of meaning. However, many contemporary Joyce scholars have challenged the concept of a higher-organizing principle in *Ulysses*, or have moved away from a deterministic account of Joyce’s work into Genetic or Narrative Criticism. Narrative studies of *Ulysses*, such as the work of Mark Osteen in *The Economy of Ulysses*, focus on its composition, its structure and the multi-faceted storytelling technique Joyce employed. Osteen notes how the segments of *Ulysses* dovetail, this engenders a shift in the style of the work from initial to latter and then back to initial again in the chapters ‘Eumaeus’ and ‘Ithaca;’ like an ellipse that links the path of Bloom’s (and the reader’s) journey from its start to its conclusion. (p.314).

Joyce scholars in the Narrative school examine the textual aspects of his writing style and relate specific facets of the book to it, in a combined synthesis of “form and content” (Attridge, 1990, p.23). The works of Fritz Senn, Derek Attridge, David Hayman, Christopher Butler, Helene Cixous and Hugh Kenner have all focused on Joyce’s complex narrative designs, but contemporary critics remain skeptical about the use of an overarching scheme to describe the narrative of the text.

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14 Michael Groden, Daniel Ferrer, Sam Slote, Luca Crispi and Geert Lernout are examples of Genetic Joyce critics. Genetic critics are interested in combining aspects of biography, historiography and literary theory in the discussion of literary works. Hypertext, Computer and Manuscript Studies are considered fundamental to contemporary Genetic Criticism. (Ferrer, 2004, p.12). In recent times, for example, the work of Michael Groden, Hans-Walter Gabler, Sam Slote and Luca Crispi in the Buffalo Archive has built the foundations for contemporary Joyce Genetic Criticism.
Of key importance is David Hayman, Hugh Kenner and Hazard Adams discussion of an ‘Arranger’ who organizes and contrives the text of *Ulysses*; Kenner goes further in suggesting that the Arranger is an architect of the *physical space* of the book. There are also other theories in Joyce Studies that diverge from the idea of an overarching ‘Arranger’ but that have noted the style-shift in terms that refer to it and all its variations throughout the text as an ‘expressive’ change, such as in the work of Walton Liszt; or that have given the Arranger phenomenon another designation, for example Kenner’s ‘Uncle Charles Principle’ extended from *The Portrait of an Artist*. (Pape, 2008, p. 45).

In the sections that follow a connection is made between the organizing mind of an Arranger, the style-shift as presented in the work of Hayman, Kenner and Adams and the logic that a game designer would typically introduce into a game scenario. It is important to state at this point that the Arranger is an *abstraction*; Hayman, Kenner and Adams are resistant to name the Arranger as Joyce, or to provide direct associations between Joyce, the Arranger and the narrator of the work. Additionally, the thesis does not intend to undermine the readings of Joyce’s text and its style variations that emphasize other qualities, such as the ‘expressive’ style or ‘Uncle Charles Principle;’ for the purpose of the argument it is necessary to sustain the idea of an organizing-principle behind the text, without undermining the readings of Joyce’s work that take an alternative point-of-view.
David Hayman in *The Mechanics of Meaning* (1970) was the first critic to name an ‘Arranger’ presence in *Ulysses* as something distinct and tangible:

The ‘Arranger’ should be seen as something between a persona and a function, somewhere between the narrator and implied author. One is tempted to speak of ‘him’ as an ‘it,’ kin to Samuel Beckett’s *Unnamable*, but we are also tempted to think of a behind-the-scenes persona like the shaper of pantomime, also called Arranger. Perhaps it would be best to see the Arranger as a significant, felt presence in the text, an unstated but inescapable source of control. (p. 122).

In *The Arranger* essay by Hugh Kenner, Kenner developed the presence of a higher-organizing principle in *Ulysses*, akin to Hayman’s Arranger, but different from the traditional literary narrator. Kenner described the Arranger of the book as “a vast order.” (2004, p.19). In his essay Kenner discusses the existence of a voice apart from the written narrative. This voice lives in the tactile material world of *Ulysses* and is conveyed through the realistic correspondence of sound effects and character’s direct responses to them (p. 20).

The Arranger, Kenner argues, is a presence developed by Joyce to offer something beyond conventional literary narrative structures. Joyce’s innovation was in arranging strands of the monologue within a framework of actual real-time experience. He then developed the book around the points of contact between characters, rather than writing them as separate discrete entities. Clear instances of the Arranger are found in Kenner’s examples: “as said again Bloom ate the innards of fowl,” and his analysis of: “Bloom’s rising of the white-gloved
policeman’s hand,” amongst other examples. (U, 7. 20-26).

Kenner gives an account of the Arranger’s presence in ‘Wandering Rocks.’

As Kenner explains, Joyce builds a density of sound in this episode through shifting from artificial noise, to crowd noise and the spoken word. Characters also notice things or events in the environment and then make obscure references to them in dialogue. This Arranger abstraction is compared by Kenner and several others, such as Harry Levin, Christopher Butler, Thomas Burkdall and Sergei Eisenstein, to the director of a film. As Christopher Butler concludes: “Joyce’s inspiration may have been directly cinematic, and influenced by the concepts of montage as we find them in Eisenstein and others” (2004, p.77).

Hazard Adams writes of an Arranger that is not an ‘organizer,’ as such, but rather a performer or trickster that misdirects or waylays the characters of the book (and the reader):

…the notion of an Arranger as a character is a constitutive critical (that is to say heuristic) category that works for Ulysses to isolate for discussion the curious sense one has of a the text including a performance; a showing-off, and an intent in performance frequently to subdue narrators and characters. (2008, p.45)

A more constructive analogy for the Arranger would be the designer of a game,

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15 There are many essays that explore Joyce’s relationship with music, theatre and cinema. Klaus Recihert in his essay on Joyce’s European Influences discerns a leit-motif: what he calls in German Gesamtkunstwerk or in English what would be called the gestalt. In this leit-motif several modes or sensory and aesthetic tropes: music, timing, lighting and dance are integrated into one medium, which Reichert calls theatrical and cinematic. (Attridge, 1990, p. 74).
from both a spatial and perceptual perspective. A game designer is interested in both pre-empting the expected input of a user, with the end aim of the user’s choices resulting in very finely-tuned visible changes in the game environment, and providing a user with a variety of audio-visual cues to follow in order to progress. Like Joyce, the designer of a game is interested in providing many different paths for a user to follow and offers sound-cues, clues or incentives as to the direction and conclusions of specific story-paths. This presence in the book, the aforementioned Arranger, is perhaps the best analogy or a game-model through which to understand the book. In a direct way Joyce builds narrative recursively, so that following a specific path through the book yields more information about that specific aspect of the story, whilst other story-paths crossover or intertwine with it.

There is such a high density of information in *Ulysses* that focusing on one specific story will always yield enough information to keep the reader invested in that specific outcome. Joyce connects these stories through specific real-time events occurring in the narrative and the points of connection between events and character’s observations or discussions as a direct response. The connection and progression of the story occurs through the arranging of several of these events over the course of the day on which *Ulysses* takes place. In this respect the design of *Ulysses* is structured and layered in a way that allows engagement with it on several levels, but still has a pre-determined outcome and a set order of cues to follow, much like a video game or a virtual reality experience.
Joyce built an immersive world in *Ulysses*. This world was based on his memories of the city of Dublin. *Ulysses* has an unusual setting as a fictional piece of work, because it meditates on its own urban mythology and its many layers of historical context can be engaged with by readers on separate, simultaneous levels, like a game or virtual reality experience. There is a parallel between Joyce’s ideas and digital media and games specifically, because games allow a user’s engagement on more than one level and provides more than one kind of sensory stimulus at a given time; effectively games create a synthesis of different sensory and spatial tropes in one experience.

The book rewards a reader who attempts to grasp all the elements of its narrative woven together. The individual experiences of characters in the story reflect or respond to specific audio-visual cues and become part of the broader spectrum of human experience in the story. It is this interactive aspect of ‘Wandering Rocks’ and the book generally that Senn, Hayman, Attridge (and particularly Michael Groden) note makes it rewarding to read as a hypertext:

The terms used to describe hypertext—associative, multi-pthed, nonlinear (or, much better, multilinear)—echo Joyce’s interior monologue techniques in *Ulysses*, in which details connect across hundreds of pages and readers progress through the masses of information in various ways, ranging from reading the text straight through to jumping around in the book (or simply skipping sections) to moving back and forth between the text and secondary materials (Groden, 2004, p.361).
As Svenson, McCarty, Kirshenbaum and Susan Hockey note, Hypertext Studies came about concurrently with the development of computers (Hockey, 2004, p.1). Not only are computers used in the electronic storage and organization of data, but also in its contextualization and the mediation of data into a variety of multimedia formats (Svenson, McCarty, Hockey, Kirshenbaum et al.). Hypertext work carried out on James Joyce’s *Ulysses* has been sparse to date, but many theorists have discerned potential for a hypermedia adaptation.

As Svenson, McCarty, Kirshenbaum and Hockey all surmise ICT tools provide new ways to explore the potentials of Hypertext Studies. ICT tools can provide this by storing and analyzing data, but also in evaluating data in a qualitative framework and as an actual physical environment. As the Michael Groden site and the *Ulysses Seen* project demonstrate, these formats also embed innovative New Media components to enhance the experience of reading the book without disrupting the reading flow of the novel.

### 2.8 Urban Spaces

Brandon LaBelle in his work *Acoustic Territories* focuses on sound culture and everyday spatial experience in urban settings. LaBelle is an installation artist and his work focuses on practical acoustical work and sound engineering in simulated spaces. A tentative connection between this work and *Ulysses* can be read in the way he discusses the flaneur and his analysis of Michel DeCerteau’s theories of *psycho-geography*. LaBelle notes how, “leaving the house, the dynamics of sound
and auditory experience open up towards a realm of greater public interaction conditioned by rhythms and the mobility of being on the go” (2010, p.6). The locomotive urban experience that LaBelle describes in the informal public life of the side walk chapter, with its unique set of acoustic and audio-spatial relations, maps the auditory experience of a city walker. It joins this experience to the social and public spheres of city life in a way that echoes Joyce’s description of Bloom’s journey:

Opening the window of my apartment on a warm sunny day, the acoustical shape of the overall room is flooded with overall input, re-mixed by the passing of cars, the humdrum of voices, birds in the trees, and the breeze...leaving the apartment, I jump out into this mass of sonority, like a tumbleweed... the sidewalk seems to overwhelm or disregard the dichotomy of silence and noise with a general hubbub rising and falling through the day and night...pockets of intensity, zones of volume, shifting gradations of acoustical flow that makes the sidewalk a sort of sound membrane contoured by the noise of the street on one side and the buildings on the other...the sidewalk throbs with acoustic life, and the walker, I suggest, beats back... (2010, p.88).

Like Bloom, whose imagination actively engages with and responds to the filled urban space LaBelle notes that the city walker is not a passive receiver of audible cues, but also pre-empts and organizes them, “beating back as a physical body.” As Joyce stated in Conversation with Frank Budgen, “in my book, the body (referring to Bloom) lives in and moves through space and is the home of a full human personality” (p.21). The informal public life of the sidewalk chapter
derives much from the work of Michel DeCerteau who was influenced by this aspect of Joyce’s writing. DeCerteau’s psycho-geography chapter in *The Practice of Everyday Life* is a psychological mapping of geographically and spatially constructed urban scenarios. In the ‘New Studies’ chapter DeCerteau and LaBelle’s methodology of mapping sounds will be developed further into spatial scenarios, using innovative game development media.

### 2.9 Game Development Media

Computer graphics offer the potential for representing a dynamic interaction between sounds and spatial dimensions. As Manovich explains without the use of panoramic sound, such as stereoscope, there is no accurate way to present directionality through sound effects in film (2002, p.16). The possibilities engendered by new developments in game media allow for elaborate extractions of space and temporal montage, what Manovich calls spatial montage. The primary method that a filmmaker uses for conveying distance from the origin of a sound is in the use of a proportional volume scale to convey distance from the sound’s source. The human ear registers perceptual aspects of sound phenomenon in locating the origin of a sound effect. There are many physical factors in determining how the ear registers these perceptual factors, of which reverberation is a key component.

Unlike film these effects can be more accurately represented in a virtual scenario where directional and spatial sound phenomenon can be manipulated to convey
distance, reverberation, echoing and the closing of proximity between a user and a sound’s source based on actual spatial dimensions. Existing game development media such as Unity3D provide an authoring interface for the creation of such a spatial environment. The Unity3D development suite provides audio functionality for the spatialization of sound, allowing content to be placed within a space in such a way that it behaves perceptually similar to real sound e.g. fading with distance, positioning, reverberation effects and direction.

Although the modeling of these effects is a production task, the authoring environment is designed to provide drag and drop authoring of interactive media content. As such game development media provides a fast, effective and reproducible methodology for separating sound and space. The unique psychological and perceptual affordances of game development media and virtual reality, in terms of providing both sound and corresponding spatial dimensions, will be explored more fully in the ‘New Studies’ and ‘Methodological Contexts’ chapters.

2.10 Virtual Learning

The concepts of Derryberry, Salen and Zimmerman: meaningful play and serious learning in games, J.M. Dondlinger’s work on virtual learning environments, Ellis’ work on educational game design and Norman’s The Design of Everyday Things will be examined in this section. The I-Ulysses project has adapted Ulysses into a spatial environment. Here the spatial and auditory aspects of the environment
are connected to specific audio-spatial events from the book, following the method of employing sound cues as employed by Joyce in *Ulysses*.

The environment adds dimensions of interactivity whereby a user can focus on specific events and then receives further information dependant on their real-time decision making. These audio-spatial events become nodes or juncture points of meaning, where users can make decisions that affect the environment and their path through it. The project joins theories of spatial and virtual montage, discussed in the preceding section, with the theories of hypertext and the concept’s relevance for *Ulysses*. The environment embeds hypertextual elements of *Ulysses* into this real-time framework of audio-spatial nodes, mirroring the book’s structure and creating an interactive learning experience.

The interactive and audio-spatial features of the project mesh together and the objective of this meshing is to provide a serious or meaningful learning experience. The manner by which the qualitative value of the environment is assessed is through use of a rigorous research and testing methodology, precedents for which are found in serious learning game studies. The fundamental learning mechanics of game design engages with the real-time principles of interaction, physics, cause, effect and goal-orientation, which “underlies the player-participation aspect of games” (Ellis, 2006, p.30). This technique is employed to focus the player’s attentions as well as giving them a goal, a sense of having some permanent impact on the objects and the space of the physical environment. Game events are precipitated by the player’s actions
producing the psychological perception of a particular interaction event, depending on its context and enforcing this relationship in the player’s mind (Norman, 1998, p.2).

This idea is referred to in game theory as a process of intrinsic reinforcement and provides a learning mechanism that underlies the potential use of games as learning tools (Ellis, 2006). In the I-Ulysses project, thus, the focus is on using sound and space to encourage the user to learn about the book employing audio-spatial cues, or what might alternately be called cross-sections of each character’s daily experience. The interactive features provided by the learning environment aim to produce an experience of what Salen and Zimmerman describe as meaningful play.

Salen and Zimmerman define meaningful play as, “what occurs when the relationships between actions and outcomes in a game are both discernible and integrated into the larger context of the game” (2004, p. 34). Anne Derryberry as part of the report Serious Games: Online Games for Learning concludes that when game design, “focuses on learning outcomes, whilst preserving playfulness, serious learning is possible” (2003, p.5). The I-Ulysses environment emulates serious learning through enforcing the connection in the user’s mind between sound, space and holding specific moments in sharp relief against the bigger picture of the unfolding ‘Wandering Rocks’ chapter.

The methodology for testing the environment relies on several models and

The scenarios, the conjecture maps, through to the testing procedure and results are outlined in the ‘Methodological Contexts’ and ‘New Studies’ chapters. The blended learning model applies traditional teaching methods to virtual learning scenarios. Garrison’s Community of Inquiry model outlines a diagram, with respective areas of intersection and overlap between the territories of traditional teaching methods and the application of New Media tools; Sandoval, McKenny and Reeves ‘Conjecture Mapping’ methodology outlines a planning approach to employing design-oriented tools in educational contexts. In many respects Garrison, Sandoval, McKenny and Reeves’ work can be read analogously to Svenson, McCarty and Kirshenbaum’s discussions of Digital Humanities and its prospective engagement with New Media, as outlined in the first section.

2.11 Conclusions

The primary objective of the ‘Review’ was to show where areas of common
ground exist that connects Joyce Studies, Digital Humanities, Digital Media Studies and game development media. The purpose of establishing this connection is to draw links between Joyce Studies and aspects of game development media that can be further developed in the ‘Methodological Contexts’ and ‘New Studies’ chapters of the thesis. The theories of Svenson, McCarty, and Kirshenbaum are used in the research with a particular focus on the synthesis and analysis of data; it is important to see how Digital Humanities concepts are of relevance to the *I-Ulysses* project. The relationship between Joyce Studies, hypertext and Multi-disciplinary work on Joyce is explored in order to connect the areas of Joyce Studies and the Digital Humanities, which in turn can be linked to contemporary theories on digital media and game development media.

As part of establishing the connection between Joyce Studies and Digital Media, it was necessary to give context to the work of Attridge and Hugh Kenner, which has been an important reference to give an overview of Joyce Studies and the more complex narrative structures of *Ulysses*. The purpose of this introduction to Digital Humanities was to show where the cultures of Digital Media and Joyce Studies share common ground. The structures of *Ulysses*, notably the presence of the Arranger, are similar to those that are employed in video game development. While not strictly being a game, the virtual environment used in the *I-Ulysses* project was constructed using a game engine. By indicating a progression from Joyce’s narrative on the page to a spatial, graphical format the *I-Ulysses* project will break new ground. It will show how Joyce’s ideas can be developed from the
hypertext format that has been demonstrated by Groden, Barger and Bolter into a truly visual and spatial format, using game development media.

In the ‘Case Studies’ segment of the ‘Review’ other projects that employ ICT and that seek to impart meaningful learning outcomes, particularly those that focus on Joyce, were discussed in terms of their common ground and how the environment would use or adapt new techniques. These examples were given to show what work is being done in the area and what the I-Ulysses project aims to contribute in terms of new learning. The key areas that the I-Ulysses project aims to contribute new learning in are the visual and spatial dimensions of Digital Media, through the innovative use of game development media and the Unity engine. Where other projects examined in the ‘Case Studies’ section focused only on one or two aspects of Joyce’s work, whether it be hypertext, heritage or aurality dimensions of his work, the I-Ulysses project is the first to try to adapt several aspects of Joyce’s work into a single immersive experience using several discrete audio-visual tropes.

The ‘Review’ investigated how Joyce Studies and game development media are connected and the cultural and historical backgrounds of each discipline are highlighted to show that there are many potential affinities between the worlds of Joyce and games. By using a goal-based narrative to show how Ulysses can be adapted into an immersive virtual format the I-Ulysses project will develop new techniques, integrating the visual and spatial aspects of computer graphics to create a truly immersive experience of Ulysses’ story. The study or concept of
hypertext has developed in certain respects concurrently with Joyce Studies and the two subjects share a common epistemic territory, which naturally blends together in the *I-Ulysses* format.

In the discussion of the works of McLuhan, Bolter, Manovich and Danius a connection is demonstrated between the areas of New Media, virtual reality and game development media. The *I-Ulysses* project proposes alternative models for using game development media, in both spatial and auditory contexts and also as a valuable tool for creating a learning experience. The work of Brandon LaBelle and Michel DeCerteau is a reference point from which to provide a concrete, practice-based analogy, or a set of acoustical scenarios, that could be implemented in the format of a learning environment. In the ‘Methodological Contexts’ chapter more of the project’s learning and teaching methodology will be discussed, in terms of providing a learning model for implementation of these scenarios. This model draws on the theories established in the ‘Review’ chapter, whilst setting up the scenarios that will be adapted into the environment in the ‘New Studies’ chapter.
Methodological Contexts

3.1 Introduction

In the ‘Methodological Contexts’ section the approaches discussed in the ‘Case Studies’ segment of the ‘Review’ will be related to facets of the I-Ulysses project, notably the use of sound and multi-linear storytelling techniques. The first section of the ‘Methodological Contexts’ section will introduce and discuss the blended learning methodology. Blended learning is a key aspect of the I-Ulysses project’s learning methodology; the following section will show how the model works in practice.

3.2 Blended Learning

This section will discuss what blended learning is, what the Community of Inquiry (COI) is and how it serves as a practical framework for implementing the blended learning model. Blended learning is a term that describes both a specific learning model in education and a model for developing ICT learning resources for classroom settings. This blended learning methodology is employed in an enhanced, interactive learning setting. Blended learning, like digital humanities, uses both teaching and humanities computing methodologies. Randy Garrison notes the popularity of the emerging blended learning methodology:
Blended learning is an approach and design that merges the best of traditional and web-based learning experience to create and sustain vital communities of inquiry... many higher level institutions are quickly positioning themselves to harness its transformational potentials (2011, p.3).

The blended learning model is accompanied by an implementation framework known as the Community of Inquiry paradigm. The paradigm is used as a method to blend learning resources and materials together into an integrated, practical learning setting. Blending learning represents a unified framework, “that merges the public and private worlds in a framework that avoids the confusion of separation into theory and practice” (p.5).

The Community of Inquiry (COI) is a tripartite model divided into three categories, or presences of the learning and teaching method (see Fig 3.1 and Fig 3.2). These are the social presence, the teaching presence and the learning/cognitive presence. The COI serves as a means to practically implement the social and cognitive aspects of education studies in a blended learning context. Because the mediation and modality of a learning material represents a further dimension of its understanding, this has lent value to the use of ICT in classroom environments (2011, p.5).

Garrison states that, “blended learning is more than enhanced lectures. It represents the transformation of how we approach teaching and learning. It is a complete redesign of the educational environment and the learning experience” (2011, p.6). Blended learning represents a potential model for implementing ICT in
teaching practice. The COI seeks to implement an instrumental framework for that blended learning, where the use of ICT is innovative and not substitutive (p.7), focusing on how specific ICT tools can provide new understanding in participatory learning settings.

**Fig 3.1** The community of inquiry Paradigm (2011, p.21)
Blended learning is a participatory learning model that combines educational theory, curriculum and humanities computing. The blended learning model’s ICT-invested approach is similar to the analytical and synthetic models of Patrik Svenson, Susan Hockey, Matthew Kirshenbaum and Willard McCarty (see the ‘Practical Analysis and Digital Synthesis’ section of the ‘Review’). As noted previously the Digital Humanities philosophy of Patrik Svenson, Susan Hockey, Matthew Kirshenbaum and Willard McCarty employs ICT in an instrumental humanities framework. The philosophy underpinning blended learning involves a holistic instrumental dimension. The research of academics working in education theory and digital humanities is transferred between the fields, whilst also yielding new research models for working with digital practice-based scenarios.

Garrison also notes that one of the main areas where blended learning enables new understanding is in distance learning, or providing remote classroom environments.
where tutors are encouraged to, “thoughtfully integrate face-to-face and online learning and fundamentally rethink course design to optimize student engagement” (2008, p.5). Garrison concludes that this is not the only benefit that ICT can afford the classroom, but that it is central in a learning format in which, “verbal, visual and aural information” is communicated and disseminated electronically. As Garrison notes, “Blended learning recognizes the strengths of verbal and text-based communication and creates a unique fusion of synchronous and asynchronous, direct and mediated modes of communication” (p.6).

In the ‘Methodological Contexts’ chapter some practice-based scenarios will be briefly described, though all aspects of the I-Ulysses project and their use in this context will be discussed exclusively in the ‘New Studies’ chapter. Instead of focusing on the environment, the ‘Methodological Contexts’ chapter will treat scenarios from Joyce’s work in ways that can be developed into learning models, with a view to expanding them in the environment’s setting. The project uses specific curriculum testing scenarios developed by Garrison in Blended Learning in Higher Education: Framework, Principles, and Guidelines (2007) and E-Learning in the 21st Century: A Framework for Research and Practice (2003); the practical scenarios, the sample-testing procedure and results are collected in the ‘New Studies’ chapter.

3.3 Critical Paradigms

In this section several aspects of the blended learning methodology will be related
to the specific methodology employed in the *I-Ulysses* project. Aspects of Joyce’s work shall be discussed and the COI will be used as a model to examine and interrogate the methodology employed in the project. The first tenet of the COI is the social presence. The social aspects of online learning represent a significant dimension of the COI and the blended learning methodology. As discussed before, Garrison notes that one of the central capabilities that ICT learning enables is the creation of remote classrooms and distance learning.

Joyce Studies has undergone a dramatic shift towards online media in recent years, as Joyce social and academic networking has a significant online presence. With the ability to communicate and share information directly, manuscript studies and archival research are now being conducted in a predominantly electronic format, evidenced by *The Buffalo Archive*. The movement of manuscript work into an online setting has had an important effect for Literary Studies, namely that the academic discussion of the original work has also shifted online in response. Many of Joyce’s larger works are read in reading groups and in a reading group the social presence is a key factor. In terms of the virtual classroom setting, there is a natural fit for reading literature together in groups and connecting that setting to a literary online community.

The second tenet of the COI is the cognitive presence. Randy Garrison argues that, “the cognitive presence is basic to the inquiry process.” He notes how, “Inquiry includes the integration of reflective and interactive processes. Cognitive presence maps the cyclical inquiry pattern of learning from experience” (2011, p.12). Joyce
encourages a reader to conceptualize and deconstruct meaning in a self-reflexive and recursive fashion. Garrison states, “cognitive presence is a recursive process that encompasses states of puzzlement, information exchange connection of ideas, creation of concepts and the testing of the availability of solutions” (Garrison, 2011, p.13). Joyce’s works have an open-meaning structure, with the possibility of a variety of different interpretations. Each interpretation can be organized into a hierarchy of individual associations and meanings; this is the hypostatic effect that Barger notes, discussed in the ‘Review.’

Joyce’s interior monologue technique portrays an individual’s inner thoughts and embeds them within the wider array of collected experiences. As discussed in the ‘Review’ with the use of ICT it is possible to sustain a network of meaning in a way that does not privilege one reading. It is possible to organize and structure these meanings within a hypertextual framework that can propagate new understanding. An online classroom is also reflective of collective experience and verbal communication in a wider, electronically-enabled setting. With digital media tools it becomes possible to explore the visual and aural dimensions of Joyce’s work and to connect them to *Ulysses*’ hypertextual structure. This gives the class the added benefit of seeing the techniques used in practice, while connecting them to the higher networks of meaning from the book.

The final tenet of COI is the teaching presence (Garrison, 2011, p.14). Garrison argues that, “teaching presence is essential to provide structure, facilitation, and direction for the cohesion, balance and progression of the inquiry process” (ibid).
There are several student guides available for readers of *Ulysses* which employ diagrams, charts and tables such as the schema of Stuart Gilbert discussed in the Review. The *I-Ulysses* project provides a learning guide to *Ulysses* that is interactive and can be studied as part of a Joyce course, or English curriculum, that complements audio-visual resources and references and supports the effort of the teacher in the classroom.

Examples of what were possible with Digital Companions and E-Books were shown in the ‘Review’ in the discussion of the *Hongshee* and *Naxos Ulysses* phone-apps. But in the *I-Ulysses* environment, when the user interacts with the environment they do so in a manner that takes them through the physical space of Dublin, while simultaneously exploring the threads of *Ulysses*’ narrative in the environment. This has the added benefit for the tutor that when they focus in on a specific aspect of the text and environment, they do not disrupt the overall flow of the environment for the students. In this way the *I-Ulysses* project preserves the instructional and operational frameworks of the blended learning model (2011, p.71), while making the experience of using the environment a participatory experience.

The many threads of meaning in *Ulysses* correspond to nodes or juncture points of meaning; Joyce provides a topographical overview of Dublin whilst conveying a complex arrangement of events through the presence of the Arranger. In the *I-Ulysses* project, the teaching presence of the COI mediates the Arranger presence and the teacher in the classroom has the objective of conceptualizing the Arranger for the class, using illustrative scenarios from the environment. Examples of these
scenarios are given in the ‘New Studies’ chapter and the areas of intersection between the blended learning methodology, the COI and the *I-Ulysses* project are shown below in a table (see **Fig 3.3**).

<table>
<thead>
<tr>
<th>Tenet of COI</th>
<th>Description</th>
<th>Implementation in <em>I-Ulysses</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Presence</td>
<td>Use of social media, reading groups, classroom setting</td>
<td>Offering the possibility for a wider engagement with <em>Ulysses</em> in a virtual format, involving several participants and complementing reading the book aloud in a classroom/reading group setting</td>
</tr>
<tr>
<td>Cognitive Presence</td>
<td>Developing a curriculum that encourages formation of meaning, in a recursive manner, with respect to the structural and cognitive aspects of learning, use of ICT to facilitate this bridge of meaning</td>
<td>Use of links in the environment, drawing the user’s attention to use of the <em>interior monologue</em> technique, the multi-linear structure of the novel and connections between key events and characters</td>
</tr>
<tr>
<td>Teaching Presence</td>
<td>The role of the teacher in facilitating meaningful learning interactions</td>
<td>Equating the teaching presence/designer of the environment with the <em>Arranger</em> of the text, the layered level design of the environment mirroring <em>Ulysses’</em> multi-linear storyline.</td>
</tr>
</tbody>
</table>

**Fig 3.3** *I-Ulysses* COI Framework Overlap
The second major education-design model that has influenced the project is the
‘Conjecture Mapping’ methodology, developed by Sandoval and discussed by
McKenny and Reeves (2004 & 2012). Whereas the ‘Community of Inquiry’ model is
focused on organizing the themes of an educational course in a blended learning
context; the work of Sandoval, McKenny and Reeves is more focused on the
implementation of tools for use in education and the design of learning
environments in a practical scenario.

Several of the flow-chart models used in the ‘New Studies’ chapter; specifically the
development of the ‘key’ output screen employed in the I-Ulysses learning
environment, were developed as an extension of the ideas of Sandoval, McKenny
and Reeves. These models are used as a means of both planning, executing and
developing the design methodology of the project and, as will be shown, drawing
the user into the design mechanisms underpinning the I-Ulysses learning
environment (see Fig 3.4 and 3.5 for examples of ‘Conjecture Maps’ provided by
Sandoval, McKenny and Reeves).

A ‘Conjecture Map’ usually takes the form of a visualized aid or graph for
understanding an interactive, design-focused process. As Sandoval, McKenny and
Reeves argue, ‘Conjecture Maps’ are a particularly useful aid in educational design
where they can conceptualize and correlate theoretical themes with the practical
contingents of a design process. In the I-Ulysses project the ‘visual’ format of the
conjecture maps provided by Sandoval, McKenny and Reeves was influential, but
the main influence was in their education-design theory, discussed below.
Fig 3.4 A ‘Conjecture Map’ provided by McKenny and Reeves (2012, p.15). In the above illustration the time involved in the specific project (the scale on the x-axis) is correlated with the number of participants involved in the study (y-axis). Segments of the map involved in different processes are scaled proportionately; showing what elements of the study took the most time and involved the most resources. The study was conducted as a computer-based project for curricular designers.

Fig 3.5 Above is a more linear ‘Conjecture Map’ provided by Sandoval (2004, p.15). The map connects the ‘themes’ of Educational Design with its ‘practice.’
McKenny and Reeves draw a distinction between research that is either ‘basic’ or ‘applied.’ ‘Basic’ research is primarily empirical, in that it “enquires about a specific theme or a problem” and ‘applied’ research is “regulative” and looks for a scientific, predictable solution to a “real world” problem. (2012, p.8). In this distinction, McKenny and Reeves argue, an artificial limitation is enforced that prevents studies into specific theoretical subjects (what they define as ‘basic’) from making scientific advancements, or design-oriented contributions.

As McKenny and Reeves note, it is possible in the field of education-design for practice and theory (or ‘basic’ research) to co-exist in a mutually enhancing, propagating faculty: “educational design research can be defined as a genre of research in which the iterative development of solutions to practical and complex educational problems also provides the context for empirical investigation (p.1).” This concept of ‘blended’ empirical and applied research is one of the central design philosophies underpinning the I-Ulysses project’s methodology; as has been demonstrated in the discussion of McCarty and Kirshenbaum’s ‘synthesis and analysis’ concept and the previous discussions of Garrison’s core blended learning methodology.

Sandoval defines the ‘Conjecture Mapping’ methodology as a means of “embodying conjectures” focused on the dissemination, and employment of educational-design tools in an educational context (2004, p.214).16 Unlike McKenny and Reeves, Sandoval focuses on joining the process of educational design, with specific maps

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16 In the map provided in Fig 3.5 Sandoval breaks down these conjectures into three relational categories: ‘Embodiment,’ ‘Mediating Practices’ and ‘Intervention Outcomes.’
and developmental routines into the ongoing practice of a finished learning environment. Sandoval defines ‘Conjecture Mapping’ as, “a means of specifying theoretically salient features of a learning environment design and mapping out how they are predicted to work together to produce desired outcomes (2014, p.19).” In this respect, the ‘Conjecture Mapping’ methodology is ostensibly useful for researchers who are investigating the use of specific tools in design, but Sandoval suggests that a more radical departure from this initial premise is introducing the process of the design elements into the practice itself and the accompanying educational-design discourse that it creates (p. 24).

The intention with the I-Ulysses project was to develop the design process into the practice of the project, following the model of Sandoval, McKenny and Reeves and to make it an element in the learning environment. As Sandoval concludes, the inclusion of ‘Conjecture Mapping’ methodologies in both design and implementation of learning practice is fundamental for realizing the potential of goal-oriented learning: what he calls “High-Level Conjectures (p. 25).”

Sandoval notes that ‘High-Level Conjectures’ can be reason enough for undertaking a specific ‘blended’ research project: “I propose conjecture mapping as a method for articulating the joint design and theoretical ideas embodied in a learning environment, in a way that supports choices about the means for testing them (ibid).” Similarly, McKenny and Reeves note: “In educational design research, empirical investigation and intervention development are intertwined. While both are core goals, it is not uncommon for one to provide the main catalyst for a project
In the following paragraphs, a brief outline of the initial provenance of the I-Ulysses project will be linked to the educational-design concepts evinced in Sandoval, McKenny and Reeves discussions; namely, that the I-Ulysses project has sought to provide an interactive, recursive instance of a ‘Conjecture Map’ model, reflecting and complementing aspects of teaching Joyce’s work.

The initial concept for the I-Ulysses project was that it would be a phone-app that a user could walk around Dublin with and consult at specific points on their path. The app would provide the user with a 3-D visualization, or a ‘game,’ that they would compare to real Dublin and the contrast between the elements of the game and the city would link to key points in Ulysses. The use of Unity Prefabs would enable the deployment of 3-D graphics and hyperlinking functionalities that would not require the use of multi-threading; a technique that conventional commercial game designers employ, which is often accompanied by significant memory overhead. The project moved away from this initial premise and more into the area of designed learning. While there is still potential for the type of augmented-reality experience noted above, the strength of the project is in its designed-learning focus.

During 2014 the author had an opportunity to conduct an EI-sponsored feasibility study into the commercial viability of the initial environment’s design and ‘game’ format. At that time, the educational focus of the project was less emphasized, in terms of its eventual deployment as an educational-design environment. The feasibility study, along with the academic placement at GV-2, was a useful process in terms of developing the educational practice of the project; from the premise of the
project being a ‘game’ to something with an articulable educational design. In this respect, the feasibility and placement were needed to get the project to the point where there was a practice to assess, but they were also about developing the technical apparatus of the project to investigate, test and formulate a design-hypothesis. The design-hypothesis of the project investigates the use of a virtual reality format to help students and teachers take account of the combined spatial, aural and contextual frameworks of *Ulysses* in an equivalent spatialized, interactive format.

The intention behind the use of ‘key’ output screens was that they would assist the user in understanding the ‘themes’ of *Ulysses*; when organized into an easily visualized format, the sets of character relationships and potential outcomes of decisions that the user makes are more easily understood. Furthermore, the intention with the *I-Ulysses* project was also to involve the user in the mechanisms underpinning the design of the environment. The user’s role is not just to engage with the content of the book, but to see a relational index expressed between the design of specific elements in the environment and the themes of the book, fulfilling a goal-oriented design relationship.

A prospective user-set for the *I-Ulysses* project would be able to update the mechanisms underpinning the environment’s design; effectively, the ‘Prefab’ utility in *Unity* making it possible for remote, user-orientated modular control of its key design components. The designer of the environment has constructed the paths and interface for the environment, while its users can build upon the map of the initial
subroutines; they could update the environment in real-time without needing significant programming skill.\(^{17}\)

Precedents for these types of interactive learning interface are not uncommon; *Twitch*, for example, is an educational design website that has published most of its design architecture (.XML) in a format that both tutors and students can change. The most significant aspect of this designed-learning process is that it is iterative and interactive and, as has been discussed in the preceding ‘blended learning’ methodology (and will be further developed in the ‘New Studies’ chapter), the practice and process of teaching *Ulysses* in the classroom reflects a wider trend in educational design towards an interactive, iterative and reflective process.

### 3.4 Exploring Joyce’s Work

In the ‘New Studies’ chapter a number of extracts from Joyce’s work will be looked at. Areas discussed previously in the ‘Review’ will be referenced there. In the ‘Theory and Practice’ section concepts from the ‘Blended Learning’ section will inform the discussion of content in this section. The examples used are taken from the ‘Wandering Rocks’ chapter of *Ulysses*. In each extract aspects of Joyce’s writing style will be examined and related to the previously discussed concepts here and in the ‘Review.’ Parallel to the discussion of Joyce, concepts from the COI will be reintroduced and some of Garrison’s scenarios will be applied to the extracts from

\(^{17}\) Conceivably the source code employed in developing the project could be made available to interested users, allowing them to include their own design and learning elements from external applications.
Ulysses as part of a blended learning scenario.

The following sections will show how a virtual adaptation of the book could be used in a practical setting. The scenarios discussed in the ‘New Studies’ chapter will be set up as if they were part of a Joyce course being developed by a tutor that would feature the I-Ulysses environment; the actual shape and design of the environment is not discussed here, but instead later as part of the ‘New Studies’ chapter. The operational aspects of the blended learning framework will be further developed in the ‘New Studies’ chapter from the scenarios mentioned in the ‘Methodological Contexts’ chapter.

Some of the spatial acoustical models used by Brandon LaBelle in his Acoustic Territories can be directly compared to the models used in the Itinerary section of the ‘New Studies’ chapter. The intention was originally for each of the scenarios to resemble scenarios from Acoustic Territories. It is important to show examples of how the I-Ulysses learning model is applied in practice; a tutor’s use of the resources as part of a blended learning curriculum, for example, means that the Purposive Sampling and Qualitative Research Analysis methods are more suitable to the I-Ulysses project’s testing process. The testing protocols are detailed further in the ‘New Studies’ chapter, but the extracts that follow are still hypothetical models rather than being practical use case scenarios, or examples of how a curriculum employing the environment would be used. ‘The Conclusion’ of the thesis will give more detailed information on how the models could be used by a tutor in the classroom as part of a prospective blended learning curriculum.
The virtual environment that the *I-Ulysses* project has developed focuses on areas of Joyce’s work that are traditionally considered to be its most challenging. These areas of difficulty include its spatial, aural and hypertextual aspects. The development of these aspects of the work will be noted in the subsequent ‘New Studies’ chapter. It will be important, in each case, to note how the *I-Ulysses* project yields new research in the areas of virtual learning and Joyce Studies, by employing and critically interrogating the methodology discussed in this ‘Methodological Contexts’ chapter. Each of the relevant presences in the text are catalogued and identified and the methods used to highlight and treat each of these presences will be discussed in an educational context.

The use of illustrative case diagrams in the ‘Itinerary’ and ‘Learning Materials’ sections of the ‘New Studies’ chapter fulfills the function of being instructions for the user, or a tutor looking to use the environment as a learning resource (the instructional aspect of the diagrams can also be compared to some of the models of LaBelle). The case diagrams will serve the purpose of validating and critically assessing the use of the game development media tools employed in the *I-Ulysses* project. Focus group samples and the testing and results of the virtual scenarios are discussed in their relevant sections; in terms of the data set analysis and the methodology underpinning the research the specific results and findings from the samples have their own section.
3.5 Virtual Design Concepts: Adaptation from Text to E-format

David Jay Bolter writes about the movement from print to the electronic format:

This movement represents one of the most traumatic remediations in the history of the Western cultural tradition. One reason is that digital technology changes the ‘look and feel’ of writing and reading. A printed book could, and did, look like a printed manuscript, its appearance changing gradually over several decades (2001, p.24).

Roger Chartier argues that the movement from print to the electronic media is more significant than Guttenberg’s development of the printing press. Chartier discusses the significance of the translation of objects to a digital format: “our current revolution is obviously more extensive than Gutenberg’s. It modifies not only the technology for reproduction of the text, but even the materiality of the object that communicates the text to readers” (1995, p. 15). Lev Manovich has argued that the movement to a HCI (Human Computer Interface) with windows and the icon-based system of the computer HUD (Head Up Display) represents a fundamental shift in the way in which textual characters are displayed visually and compares these new formats with cinema, photography and television (Manovich, 2001). Manovich goes on to discuss the significance of the shift in terms of its importance for understanding narrative and the “narrative potentials” of video games. Manovich argues that the epistemic and narrative effects of these “electronic databases” represents a new means of understanding spatial relationships with perspective, story and narrative and he notes that these formats should be critically investigated.
further.\textsuperscript{18}

McLuhan writing when computer technologies were not widely understood, argued for an understanding of the “liminal space” (1994, p.79) between the conveyance of electronic media and human intelligence, effectively pre-empting the HCI. Likewise Lev Manovich writing more recently in the 1990s can be considered instrumental in the development of Digital Media Studies as an independent field of study from Computer Science. The translation of cultural objects to a digital format is an interest for both McLuhan and Manovich, particularly for Manovich in his analysis of the video game medium and spatial narrative. Spatial narrative and game development media will be discussed further below.

In this chapter and the ‘New Studies’ section it is noted that the \textit{I-Ulysses} virtual environment is not a game, but that it has been built with a game engine. Work done in the areas of virtual reality and game development media crossover,\textsuperscript{19} for this reason discussing academic work done on serious learning, meaningful play, virtual reality and game development media is still a primary focus of the research; especially given that the environment was built using the \textit{Unity} engine. Game development media was chosen as a term to describe the tools used to create the environment, rather than suggesting that the environment itself is a game.

Video game design provides a number of unique features that differentiate games

\textsuperscript{18} Manovich uses the term electronic database to describe all computer applications, specifically video games, but tends not to differentiate between them.

\textsuperscript{19} This is because the tools employed in virtual reality and game design tends to be similar.
and virtual reality from earlier types of electronic media:

- Games now set the industry standard for graphics and are at the meeting point between the technologies and arts.\(^\text{20}\)
- Games are natively digital. They are a visual medium borrowing from earlier narrative modes, such as cinema, while also having a distinct set of gaming narrative aspects. The Ludology vs. Narratology debate will be discussed in the next section.
- Games represent narrative, in having a set of pre-defined goals to complete, and have been used to adapt other stories from different media such as films and books (The Godfather, Scarface, Lord of the Rings etc.), but not very frequently.
- Games try to represent perceptually realistic spatial dimensions; Manovich argues that the representation of perspective in games is the key to understanding spatial narrative.

Lev Manovich connects spatial narrative and perspective in his chapter on video games; he begins the discussion with an analysis of perspective in painting. In the late 14th century, the period which historians refer to as the Quattrocento, new conventions emerged in painting that emphasised a geometric understanding of spatial relations in three-dimensional space on the two-dimensional canvas. These

\(^{20}\) Michael Lewis notes: “The most sophisticated rendering pipelines are now found not on specialized scientific machines but on PC video cards costing less than $500. The most sophisticated, responsive interactive simulations are now found in the engines built to power games” (Michael Lewis and Jeffrey Jacobson, 2002, p. 22).
conventions emerged in response to new technological developments and mathematics, particularly in geometry, that led to significant re-evaluations in the way 2-D and 3-D space was perceived. Manovich cites the discovery of perspective as a key moment in the visual culture of western history. Manovich argues that the spatial nature of western narrative is now being represented by Electronic and Digital Arts. As was noted in the ‘Review,’ he has argued for a dramatic re-appraisal of narrative culture in the twentieth century, primarily its relationship with cinema:

Cinema replaced all other modes of narration with a sequential narrative, an assembly line of shots that appear on the screen one at a time. This type of narrative turned out to be particularly incompatible with the spatial narrative that had played a prominent role in European visual culture for centuries (2001, p.18).

Manovich goes on to discuss visual alternatives to the cinematic mode of representation in computer graphics. Though noted in the ‘Review,’ Manovich’s comments on spatial narrative are relevant to discuss here in the context of game development media. Computer Graphics represent spatial dimensions directly; building geometric environments and shapes. The sense of perspective or the development of a spatial narrative is a starting point for the game’s designer, even before the development of the story, in terms of what the game will look like and how the user will interact with it. For a filmmaker or a painter usually the story, or the image, is the starting point; it is something that the scene is developed from rather than the other way around. Manovich sees computer games as separate from other visual media on account of the spatial aspect of its narrative:
Computer games are directly experienced by their players as narratives. In games, the player is given a well-defined task winning the match, being the first in a race, reaching the last level, or attaining the highest score. It is this task that makes the player experiences the game as narrative. Everything that happens to them in a game, all the characters and objects she encounters, either take her closer to achieving the goal or further away from it. Thus, in contrast to a CD-ROM and Web database, which always appear arbitrary because the user knows additional material could have been added without modifying the logic, in a game, from the user’s point of view, all the elements are design motivated (ibid).

The gaming experience does not need to be linear in the way a book or play is. The interplay between the interactive, multi-linear aspects of the game experience and the completion of the game’s objectives is where the games developer starts, deciding how to build it. From this point of view games have both an instructional and operational procedural dimension; the Ludology vs. Narratology debate in games theory discusses these concepts. Janet Murray in *Hamlet on the Holodeck: The Future of Narrative in Cyberspace* (1997) argues for understanding games from the perspective of conventional narrative, or Narratology:

Digital environments are procedural, participatory, spatial, and encyclopaedic. The first two properties make up most of what we mean by the vaguely used word interactive; the remaining two properties help to make digital creations seem as explorable and extensive as the actual world, making up much of what we mean when we say that cyberspace is immersive (1997, p. 71).
Mark Wolf has taken up a different point of view. Wolf argues that games are essentially distinct from conventional narratives as they involve the added dimension of play or Ludology (2002, p. 71). Wolf uses the example of the game developer Hideo Kojima, the developer of the *Metal Gear Solid* series, as an example of a game auteur. Wolf draws conclusions about the practical nature of game design that frame the argument, stating that Kojima’s games are heavily influenced by cinema, whilst still having a specifically game-focused design. In this interview, Kojima distinguishes the difference between a conventional narrative and game storytelling techniques:

> Storytelling is very difficult. But adding the flavour helps to relay the storytelling, meaning in a cut scene, with a set camera and effects, you can make the users feel sorrow, or make them happy or laugh. This is an easy approach, which we have been doing. That is one point, the second point is that if I make multiple storylines and allow the users to select which story, this might really sacrifice the deep emotion the user might feel; when there's a concrete storyline, and you kind of go along that rail, you feel the destiny of the story, which at the end, makes you feel more moved. But when you make it interactive - if you want multiple stories where you go one way or another - will that make the player more moved when he or she finishes the game? These two points are really the key which I am thinking about, and if this works, I think I could probably introduce a more interactive storytelling method.

*(Kikizo, 2011, p. 3)*

The application of game design tools in the practice of making games is a fundamental part of video game design, as it simultaneously informs the narrative...
and design aspects of the game. In this section the building blocks of game design will be noted as distinct in digital modelling, animation and rendering; the practical aspects of how these building blocks convey story and impart motivational factors for the user will be addressed. In game development, stories emerge from this design process rather than the developmental process being built around a story.

The I-Ulysses project develops an instrumental use of digital tools in the design process of its learning environment, which involves an understanding of aspects of both humanities and technologies and the context of Joyce’s work. This focus will be more fully developed in the ‘New Studies’ chapter. The design focus makes the project distinct from both commercial games and other e-learning formats, such as the Digital Companion, website or phone-app formats, because these examples are using pre-existing software as part of their development agenda. The I-Ulysses project has a focus on developing links between the learning potential of the media, the content of Joyce’s work and fundamental aspects of virtual design. The developmental agenda of the I-Ulysses practice-project is focusing, for this reason, on several areas of Digital Humanities and virtual reality rather than gaming.

Virtual designers use a variety of development tools building virtual environments to create a sense of space through use of perspective; this is partly a mechanical, mimetic reproduction and partly perceptual in terms of how the user relates to the narrative of the environment. Alison McMahan in her essay Immersion, Engagement and Presence identifies a relationship between game narrative theories, graphics and a sense of immersion. In her chapter: The Trend Towards 3-D Design she plots a
timeline of game development media tools and defines the relationship between the design elements of the game and narrative presence and immersiveness (Wolf, 2003, pp.67-87). In her work she combines both timelines provided by Wolf and Poole in their introduction to *Trigger Happy Games* and points to specific game design conventions that distinguish the medium from cinema:

Most 3-D games represent their navigable space using the conventions of Hollywood cinema, at least to a degree. The difference, of course is that these spaces are navigable; first-person shooters and virtual reality games, for example, provide players with an unbroken exploration of space, allowing them to pan, tilt, track, and dolly through the space which is usually presented in a first person view (p. 70).

As Poole writes in *Trigger Happy* the strength of the game medium is that it can present a continuous unbroken, overview of a physical space. From this point of view a game can simulate the impression of space more realistically than cinema or other visual media:

In video game terms, an illusion of solidity is created while preserving an external view-point. You could see the three sides of an object rather than just one; and now, crucially, the game screen was not just a neutral arena, it had become an environment... the foreshortening of scientific perspective had certain advantages: it implied a subjective, individual view point, and it promised a degree of immersiveness (2000, p.212).

Computer graphics convey an accurate representation of physical space and the skin
or surface of an object retains the vanishing point that a viewer’s point-of-view (POV) would have in real-life as they move towards an object. A POV that is set a few feet behind a player that follows like a moving camera on a track is generally agreed to be the best technique for simulating realistic immersion; if the character can stop and look around it helps to enforce the perceptual impression of being in wide open space. These effects combine to create an impressively realistic spatial experience, particularly if the game is set in a detailed environment.

Game development media is notably different from cinema in this regard because it uses a combination of the previously discussed graphical techniques to create a directly realistic sense of space and 3-D perspective. Through the use of game development media, the use of sound effects, and realistic isometric lighting it can create a more perceptually realistic experience than a video or cinematic representation of the same space. It follows that a user who sees the representation of the more perceptually realistic environment, with sound effects, is more meaningfully immersed in the experience of the environment. This means that a virtual environment can be a useful educational tool because it directly engages the user in the experience of the content they are learning about, especially if it has a spatial dimension.  

Salen and Zimmerman in the book *Rules of Play: Game Design*

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21 In recent years games designers have moved away from the open design aspects of games and moved more towards the closed dynamic of pre-rendered environments. A pre-rendered environment is one that has a set background or a landscape through which characters move and interact, rather than being something which has to be significantly modelled to interact with. The move to pre-rendering has occurred because it is a considerably easier and cheaper effect to achieve than a fully interactive virtual environment.

What pre-rendered games do offer, however, is the potential for some impressive lighting dynamics and a more painterly (or cinematic) environment for characters to traverse through, as the environment forces a user to follow a set path rather than being open. This has come about on
Fundamentals derive a list of considerations for what constitutes a game narrative.

It is useful in the context of the environment’s scenarios to address each of these points, referring directly to the *I-Ulysses* project:

When we frame the space of possibility as a narrative space, a special set of questions arise: where do narratives in a game reside? How can one design games as narrative experience? What kinds of narrative experiences do games make possible? What is the role of narrative in meaningful play (2004, p.378)?

Meaningful play is defined as being when a game has a distinct set of goals for the user and integrates these goals into the higher objective of the game. Salen and Zimmerman define meaningful play as, “what occurs when the relationships between actions and outcomes in a game are both discernible and integrated into the larger context of the game” (2004, p.378). Salen notes that the design and function of an effective educational game follows the same principle, “good educational games will consider the learning goals, content and game play at the same time” (ibid).

The *I-Ulysses* environment’s Waypoint system, discussed more in the ‘New Studies’ chapter, compels the user to observe how specific objectives in the environment map onto the themes of *Ulysses*, creating an experience of meaningful play. Salen and Zimmerman conclude that the use of games as meaningful learning tools can account of a realization on the part of games designers that the propagation of light is more important in enforcing the sense of perspective then modelling physical geometries. In moving away from the more open-world approach a game loses an important quality that separates it from a video or cinematic representation.
benefit both the game industry and academic institutions. J.M. Dondlinger in his report *Educational Game Design* notes that, “educational video games require strategizing, hypothesis testing, or problem-solving; usually with higher order thinking rather than just memorization” (2007). A central objective of the *I-Ulysses* project is to show how a user is provided with an involving experience of the book. The experience is framed in a setting designed to be immersive and that requires a higher-order engagement with the Waypoint system to progress.

### 3.6 Conclusions

A virtual environment can stimulate the desired learning outcomes by adapting Joyce’s book and its aural, spatial, temporal and contextual themes in a way that is aesthetically pleasing and can reflect and enhance the learning objectives of a traditional Joyce course. A virtual environment can complement these learning objectives by offering a play-based experience of *Ulysses*’ narrative. This play-based experience of the narrative is what the focus groups employed in testing the scenario were asked to assess, in terms of the contribution of the project and ways that it could be changed for the better. The main objective of assessment for the samples was for the students, in both the verbal and written responses, to note a connection between the use of the Waypoint system, key points in the book and the literary techniques that Joyce used. This process will be outlined further in ‘New Studies’ chapter.

Salen and Zimmerman note how, “playing a game means interacting with and within
a representational universe, a space of possibility with narrative dimensions.” (2004, p.378). A game’s levels have a certain order in which tasks can be completed. This order follows and creates a system that incentivizes the user; following the rules of a game environment leads to a fuller engagement with the game’s content.

Engagement with specific prompts result in new outcomes, tasks to complete and views through 3-D space. As Salen and Zimmerman state, a game is, “formed by rules and experienced through play, it is a space of possible action that a player activates, manipulates, explores and transforms.” (ibid).

While a user can follow a number of possible paths, within each of these discrete paths there is a variety of different choices. Instead of prescribing the player’s choices, games encourage consistent engagement with the content of the game, but do not focus on any one specific path or the outcome of the game’s story. Games attempt to convey several views of a world; this is comparable to Ulysses in that the technique can contrast with and be compared to the book. The book encourages the reader to see the connections between different story paths and this can be mirrored through the Waypoint system discussed further in the ‘New Studies’ chapter. Such an environment would not employ a number of the more conventional motivational principles that a commercial game might; instead it incentivizes players to proceed based on connecting a series of different views, or perspectives, on the same space, much like Ulysses does.
New Studies: *An Analysis of the Process and Practice Behind the I-Ulysses Project*

### 4.1 Introduction

In the preceding ‘Methodological Contexts’ chapter some of the instructional methods of the blended learning methodology were discussed. Now the thesis will move on to discuss the operational aspects of the environment. It was discussed previously how the objective for a user of the *I-Ulysses* environment is to experience and learn about the ‘Wandering Rocks’ chapter of *Ulysses*. The user can play as several characters: Bloom, Blazes Boylan and Patrick Dignam Jr., with Boylan’s Secretary, Kernan, Milly Dedalus, Nosey Flynn, Tom Rochford, Molly Bloom and Almidano Artifoni fulfilling supporting roles. The environment adapts the chapter’s narrative into an immersive virtual environment, employing a diverse range of multi-sensory cues and narrative tropes. This environment turns the complex auditory and spatial relations of ‘Wandering Rocks’ into a multi-modal\(^\text{22}\) virtual setting, replete with sound cues, context-sensitive objectives and interaction events.

Through the correlation of sound, space and the spoken and imagined word the user is tasked with understanding the relationships between *Ulysses*’ characters in a freely associative, rather than directly linear way. Users are encouraged to see the

\(^{22}\) A multi-modal setting refers to a virtual reality setting that blends different types of audio-visual stimulus and conveys information on several discrete levels.
hierarchies and associations between characters, rather than looking at discrete
temporal events in the story. In doing this they gain access to new levels of the
environment. This encourages the user to think about the book’s themes, employing
a virtual learning model to guide them.

This ‘New Studies’ section will go over the steps taken in constructing the *I-Ulysses*
virtual environment. The section will discuss what technical choices were made in
building the project, how these choices relate to the principles discussed in the
‘Methodological Contexts’ section and how the user’s learning goals, derived from
these principles, are tested in practice. The following ‘Overview’ section will focus
on showing how the methodologies explored in the previous section are developed
into practical scenarios and will demonstrate how this project has grown into a
testable environment. The ‘Overview’ section will demonstrate how the
environment re-envisions the spatial and auditory aspects of Joyce's work.

The ‘Overview’ section will briefly describe the technical aspects (coding, platform,
deployment) of the virtual learning environment and also the ‘Itinerary’ section. The
main technical aspects of the project, such as the rendering of the environment and
its deployment, will be discussed in an Appendix section. The main areas of focus
will include: the use of Prefabs, which are a generic feature of the game engine
being used to build the environment; the use of a Waypoint system; and the use of
the two-world mechanism. The Prefab functionality of the Unity3D game engine is
the reason why the engine was chosen over other more commercially successful
engines, such as Unreal. In the ‘Testing and Results’ section the test samples of the
environment will be discussed. Testing was conducted at the James Joyce Centre in Dublin, at the The University of Vienna and the National University of Ireland Galway.

4.2 Overview of the Environment

The learning environment prototype recreates the ‘Wandering Rocks’ chapter of Ulysses. This chapter takes place in an area corresponding to roughly four square miles around the Dublin Quays. A table describing the setup of the scene in the book and the story dynamics underpinning the virtual version is given in Fig 4.1 (see below). Stephen Dedalus is a young teacher and writer and the first main character introduced in the story. Leopold Bloom is the second major character; he is a middle-aged ad canvasser living on Eccles Street. While Ulysses is focused on the two characters eventually meeting, in the ‘Wandering Rocks’ chapter they never directly speak, though Bloom does notice Stephen on Kildare Street and gives him a light for his cigarette.

The chapter features all the characters of the book in one place at one time. Joyce creates a complex web of associations between the characters in the chapter and things they have done, or will do, later in the day. The connections between characters revolve around specific associations between Bloom and Stephen. ‘Wandering Rocks’ is a pivotal chapter, because it pre-empts the meeting of the two men later by setting up many of the story arcs and character relationships that connect them together in the setting. These points of contact are adapted into
structural nodes in the prototype environment; completing objectives at certain nodal points creates new goals for the user to unlock and progress. The environment attempts to capture several facets of the characters’ experience: the interior monologue technique, the back story of the characters, a topographical overview of the Quays area of the city and the use of spatial sound effects. These facets are represented in the environment by the use of thought bubbles, the use of a bonus level mechanic, the use of a map and the use of sound effects. Joyce employs these techniques in the ‘Wandering Rocks’ chapter and nowhere else in the book are these techniques seen as clearly, or used to the same extent. In the table below a set of relationships between the characters is established (see Fig 4.1).
<table>
<thead>
<tr>
<th>Character</th>
<th>Mission</th>
<th>Objects</th>
<th>Monologue</th>
<th>Area</th>
<th>Back Story</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leopold Bloom</td>
<td>Get to the Book Vendor</td>
<td>The Car; Tom Kernan; Map; Clock</td>
<td>Thinks of Stephen outside Trinity</td>
<td>Capel Street</td>
<td>Bloom in Palestine</td>
</tr>
<tr>
<td>Stephen Dedalus</td>
<td>Talk to Artifoni</td>
<td>Listen to the Narration; Artifoni</td>
<td>None</td>
<td>Trinity</td>
<td>The Martello Tower</td>
</tr>
<tr>
<td>Patrick Dignam Jr.</td>
<td>Walk by the Shop front</td>
<td>Collect the Boxer’s Poster; Tom Kernan</td>
<td>Father’s Funeral</td>
<td>Dame Street</td>
<td>The Jesuit School</td>
</tr>
<tr>
<td>Boylan</td>
<td>Bet on Scepter</td>
<td>Collect Coin from Molly; Speak to Patrick Dignam</td>
<td>Ascot Cup</td>
<td>Nassau Street</td>
<td>None</td>
</tr>
<tr>
<td>Tom Kernan</td>
<td>Meet Boylan at the Phone Booth; find out who will win the Ascot Cup</td>
<td>Gramophone; Boylan</td>
<td>The Car</td>
<td>Nassau Street</td>
<td>Stable</td>
</tr>
<tr>
<td>Artifoni</td>
<td>Convince Stephen to study music</td>
<td>Stephen, Tram</td>
<td>None</td>
<td>Trinity</td>
<td>None</td>
</tr>
<tr>
<td>Molly</td>
<td>Throw coins for Boylan</td>
<td>None</td>
<td>None</td>
<td>Grafton Street</td>
<td>None</td>
</tr>
<tr>
<td>Tom Rochford</td>
<td>Gramophone</td>
<td>None</td>
<td>None</td>
<td>Pub</td>
<td>None</td>
</tr>
<tr>
<td>Simon Dedalus</td>
<td>Talk to Milly</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Secretary</td>
<td>Gramophone</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

Fig 4.1 Table showing the ‘Characters, Missions, Interactions and Back Stories’

The environment encompasses an area corresponding to Trinity College Dublin, Nassau Street, Grafton Street and Dame Street. The environment features several playable characters all of whom are based on those from the ‘Wandering Rocks’ chapter. The area is spatially realistic, in terms of its dimensions and the characters’ appearance; it is roughly based on the descriptions given by Joyce in Ulysses.
street sections used in the city do not correspond exactly to the locations of the characters in the book, though it does fit the order in which the concerned events unfold. The environment conveys, as closely as possible, the key narrative techniques and storytelling tropes Joyce employs in ‘Wandering Rocks,’ rather than representing a completely direct adaptation.

The environment provides a user with a spatial version of Joyce’s narrative from the ‘Wandering Rocks’ section of the book. The environment is not a direct adaptation of the chapter, nor does it recreate the unfolding scenarios in the same way. Rather it attempts to convey the unfolding scenarios in the scene in the same spatio-temporal manner as Joyce does. It provides the user with a further insight into the urban setting that Joyce creates by holding its style and narrative techniques in sharp relief against the spatial, aural and interactive features that game development media can provide. In this way the I-Ulysses project is not an adaptation of Ulysses; it represents a remediation of some of Joyce’s distinctive writing techniques into a spatial, temporal setting.

The environment’s objects, textures and character models appear to fit differing time periods. The use of different time periods was employed for several reasons. Firstly, for the purpose of practicality; due to the availability of models, textures and images employed in rendering the environment, specific models and characters were chosen to fit the Joycean setting more appropriately. In many cases, the models which commercial game designers employ are not suited to the Victorian

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23 Spatio-temporal refers to events happening in the same place at the same time.
period specifically. The city environment employed as the basis of Victorian Dublin, for example, required several texture changes to make it appear suitable to that time period. Trams, horse-drawn carriages and period advertising and posters were also added, to this end.

Secondly, the cultural awareness of *Ulysses* extends beyond the original setting of the book, to the point where tourists in modern Dublin may be more familiar with depictions of Joyce’s characters in recent times and adaptations of Joyce’s work from the 1960s and 1990s.24 The shifting time period creates the sense of the user being a tourist in modern Dublin, looking back at events from the Victorian past. The use of period advertisements, costumes and objects is intended to frame the Victorian period of *Ulysses*’ setting; rather than the environment’s setting being exact in terms of historicity.

The use of the different time periods also reflects one of Joyce’s techniques in *Ulysses*; his creation of an environment that references numerous cultural and historical moments and that represents Dublin as an accretion of different social and historical influences. Reflecting these techniques, a navigational mechanic had been intended where the further the user strayed from set objectives the more modern the city would appear; if the user kept to a specific path, the environment would more closely resemble the Victorian period.25

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24 An intention for the environment was that it could be used as a walking tour guide, given that it is a spatially and geographically realistic representation of Dublin.

25 In the current format of the environment it is more difficult to stray from a set path, because streets outside the relevant sections of the story are blocked off.
As demonstrated in the ‘Methodological Contexts’ section the writing techniques that Joyce employs are: use of the interior monologue; use of multiple points of view, use of cinematic techniques such as editing and montage; use of sound cues and the use multi-linear storytelling devices. In the ‘Using the Environment’ and ‘Learning Materials’ sections explanation is provided of how specific Joycean literary techniques or tropes are adapted with the interactive game development media. These interactive features of the environment will also be discussed in the ‘Itinerary’ section, in terms of how they relate to Joyce’s key ideas. The mapping of sound effects is a key aspect of Joyce’s work and will be noted in the ‘Itinerary’ section. Later on in the ‘Testing’ chapter the measuring or success of employing the techniques described in the ‘Itinerary’ sections will be noted, in terms of what was learned during the process. The following ‘Itinerary’ section will give a brief overview of the environment and its many levels or interlocking layers.

4.3 Itinerary

The user takes control of an avatar in the environment representing one of the characters from ‘Wandering Rocks’ and navigates through the area, looking for points of interest and objectives to discover. The view of each character is conveyed through a modular third-person perspective, meaning that the height of the camera, its depth and priority in the scene will change depending on what character the player is using and at what time. The use of context-sensitive camera functionality corresponds to Joyce’s use of multiple points of view and montage; players can see what other characters are doing at a given time as the action cuts between them.
The user’s sense of direction is conveyed through the use of directional lights, or lens-flares, which indicate the direction of objectives in the scene. These lights are the prompts for the user to follow and text menus appear when the player has interacted with a specific objective and activate it. When the user obtains the map icon, they gain access to a map of the area. This map shows the lights corresponding to active objectives and has arrows showing the player where they need to go. The map shows the location of the other characters, represented by coloured dots. The map also shows text from the book and as the user progresses through the environment the relevant text will change.

The coin and gramophone icons show scenes of other characters and music from Joyce’s works play over the text menus. The tyre icon, collected by Leopold Bloom, shows the path of the motor car. Each icon refers to a key point, image and sound effect taken from ‘Wandering Rocks.’ The user can explore the environment for different icons or just head from one level to the next. If they do this they will progress through the environment, but they will not gain access to additional levels or interlocking layers of play experience. The loading of new scenes and objectives is governed by a clicking system which is context-sensitive; it depends on what the Player tag is at the time that the user clicks on a specific objective, person or object in the scene. Clickable objects will appear black when the mouse moves over them.

The tagging mechanism allows the user to progress based on a specific order of events or set conditions, whilst interactive prompts tell the user what they should
be doing at a given time. The tags are set by unlocking a specific combination of objectives. The user can explore and interact with points of interest in the environment as they appear in the book, progressing forwards based on what objectives they have unlocked. Points of interest are accompanied by distinctive sound effects relating them to specific events for the ‘Wandering Rocks’ chapter: a car horn, the noise of a typewriter, a tram and coins dropping. User progress occurs through the unlocking of a specific set, or bundle, of objectives together, making the user think carefully about the combination of events in the scene rather than focusing on any single character’s path exclusively. The back story segment is accessed through completing a bundle or combination of these objectives in a specific order.

Points of interest appear in the environment in the order that they come up in the book and this strengthens the relationship between the audio-spatial events of the book and their appearance in the environment. As the user is interacting with the environment the things which they are hearing (which sometimes lack explanation in the original text) are given a context as the user encounters them in the environment as audio-spatial events. The bonus level represents a different layer of the environment and uses a different navigation system. In the bonus level the objective is to learn about a specific event or sound from the city. When the user returns to the ‘Wandering Rocks’ level they then will be thinking about what they discovered in the bonus level. In this respect the mapping of sounds is a key dimension of the I-Ulysses project.
The user character projects their thoughts about what they learned outwards into the city environment; this technique is represented in the environment by the use of a thought-bubble appearing over the character’s head. The thought bubble shows what the character is thinking at the time and this may change depending on what bonus levels the user has completed, if the user did not complete a bonus level normally no thought bubble will appear. This technique represents Joyce’s use of the interior monologue. A list of discrete interaction events from the environment follows.

**Discrete Events and Themes**

1) The default character is Leopold Bloom (see Fig 4.2). Bloom is a central character, along with Kernan, Blazes Boylan and Patrick Dignam Jr. When using a central character the user interacts with other characters through them and then takes over as that listed character for each relevant segment. Central characters navigate the global space of the city; each of the specific local spaces and interaction events is unlocked by them. Bloom’s first mission is to get to Tom Kernan; Bloom later heads to the book vendor on Capel Street. Bloom also has several optional objectives that the user can interact with by clicking on, such as the clock, table and tyre icons.
2) When Bloom interacts with Kernan the level will transition to Kernan’s perspective; the user observes a change of time and Kernan moves from where he met Bloom to outside Trinity. The user will then take over as Kernan (see note #3). After this segment the user returns to Bloom and he will have a thought bubble showing his observation of Stephen Dedalus from earlier on, who is also outside Trinity (see Fig 4.3 and 4.4). The user has a choice. If s/he clicked on the clock, instead of going directly to Kernan, the user gets access to Bloom’s backstory: Bloom in Palestine (see Fig 4.5). The user will then play as Bloom again, but will now have the option of interacting with the tyre icon and watching the motor car pass Kernan.
Fig 4.3 Later on in the environment the user sees these events from Stephen and Artifoni’s point of view. In this section the user will see Kernan stood at the point where Bloom left him.

Fig 4.4 Bloom’s thought bubble: seeing Stephen by the tram outside TCD.

Fig 4.5 Bloom in Palestine: note Bloom’s character in the corner.
3) When using Kernan, the user is encouraged to collect the gramophone icon. When they do this they will see a scene of Tom Rochford in a pub operating a gramophone and the song *The Croppy Boy* will be played. Dialogue from the scene in the pub will play over the music (see **Fig 4.6**), a poster for *Gold Flake Cigarettes* is seen hanging on the wall in the corner of the pub (see **Fig 4.7**). This segment uses songs and advertisements which Joyce mentions in the text, immersing the user in the material world of *Ulysses*.

**Fig 4.6** Kernan: note the gramophone icon corresponding to a light on the map.
4) The user is prompted by text to head towards the phone booth, where Blazes Boylan is betting on the Ascot Cup. Note that the thought bubble over Kernan’s head will show a motor car. This is the car that passed Bloom and Kernan earlier.

5) When the user clicks on Boylan at the phone booth they will transition to Boylan’s point of view, similar to how the transition occurs between Bloom and Kernan. The user will observe the change of time between Kernan and Boylan’s scenarios and gain text-based information about the Ascot Cup and the horse Throwaway (see Fig 4.8). Throwaway represents an important subplot from the book: Bloom accidentally gives the tip Throwaway to Bantam Lyons, while Boylan bets on the favorite Scepter; the transition

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Fig 4.7 ‘Gold Flake Cigarettes.’ an example of an advertisement from the book.

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26 Bantam Lyons meets Bloom on the street in the book, Lyons is looking for a tip from Bloom who
scene’s text menu explains the subplot and gives added significance to Boylan and Kernan’s stories. Boylan’s mission is then to make his way from the top of Grafton Street to Dame Street. On the way Molly throws a coin, as she does in the book, which Boylan can collect. If the user does this, footage is shown of his secretary.

![The Stable of Throwaway](image)

**Fig 4.8** The Stable of Throwaway

6) When the user controls Boylan, a thought bubble will appear over Boylan’s head showing Boylan’s bookie betting on the horse Scepter at the Ascot Cup (see **Fig 4.9**). Now controlling Boylan, the user collects the coin and speaks with Patrick Dignam Jr.

tells him to “just throw it away,” meaning the newspaper he is carrying. Lyons takes this to mean Throwaway the horse, who wins. Both Kernan and Boylan had bet on Scepter.
Fig 4.9 Boylan’s level: note his secretary is in the corner, the text menu will play *The Lass of Aughrim*. Boylan has a thought bubble showing his bookie betting on the Ascot Cup.

7) When Boylan speaks with Patrick Dignam Jr. the user will transition between Patrick and Boylan. During the transition scene the user learns about the death of Patrick’s father and the effort being made to get Patrick into the Jesuits. Patrick’s mission is to head along the shop fronts. Patrick can click on a poster of Jim Corbett (see Fig 4.10), the Irish-American boxer. Patrick notices the poster in his interior monologue segment from the book. If he does this then footage of Bloom will appear. Bloom is walking towards Capel Street to meet the book vendor.
After passing the viceregal cavalcade, Patrick will speak to Kernan and then the environment will transition to Bloom again, picking up where Kernan left him. Bloom’s mission is to get to the book vendor on Capel Street. Following the path to the vendor unlocks Stephen and Artifoni’s section, shown earlier, and later the Chapel at Clongowes (see Fig 4.11).
9) In Artifoni and Stephen’s section it is possible to see Kernan stood outside TCD where Bloom left him. Artifoni sits on the top deck of the tram; he is thinking about the conversation he had with Stephen earlier that day (see Fig 4.12). Artifoni can also observe Stephen Dedalus walking by Trinity College Dublin. A window in the lower right hand corner of the screen shows the two men talking outside TCD earlier and the passing of the viceregal cavalcade. The appearance of the clock here shows the time that Bloom left Kernan. The clock is the time-keeper of the environment. Joyce uses the clock motif in the book as a symbol for the passing of chronological time.

![Fig 4.12 Continuing on from before at the current time](image)

10) In the environment the clock is present in Bloom’s level, at the Martello tower, Artifoni, Kernan and Boylan’s levels, showing that the different stages of the environment have some common time zones. These zones will activate depending on the user’s interaction, allowing the user access to new levels. The clock also shows that the time is being kept even when the user is in a bonus level. The Martello Tower (see Fig 4.13) is Stephen’s level
and the final level of the environment. Once the user finishes the tram segment with Artifoni they are transported here.

![Image](image.jpg)

**Fig 4.13** The Martello Tower and Chapel scenes explain Stephen’s back story: the death of his mother; his history with the Jesuits; the trip to Paris, and his current predicament in the Tower. In the environment the stories of Patrick and Stephen are connected to join the two sections of the ‘Wandering Rocks’ chapter and also to provide background for Stephen’s motives from *A Portrait of the Artist* (like Patrick, Stephen was being coerced into joining the Jesuits; Stephen is now being pushed into a career in music by Artifoni).

Each of the objectives in the environment follows this multi-linear story pattern.

There are several bonus characters or stories that vary throughout the environment depending on user’s choices. These character’s stories can be accessed as bonus missions upon completing the final level at the Tower; Milly Dedalus is one of these characters. Her scene is with Simon Dedalus; Stephen’s father. Molly Bloom makes a brief appearance in the chapter, throwing a coin out of the window for a beggar, which Blazes Boylan picks up as an icon on his mission. The secretary Ms. Dunne
also has a bonus mission. In addition to the connecting time zones the central procession of the viceregal cavalcade is a key part of the action in the ‘Wandering Rocks’ chapter. In the environment the cavalcade travels from the Phoenix Park to the Mirus Bazar. Any central character that is close to this area can see the cavalcade. The sound from the procession is heard at several key junctions in the environment, represented by the noise of horses. The tram fulfills a similar audio-locative function. The tram cars are an important spatial event as they make their way through the full setting, establishing the geo-spatial boundaries of the environment and encompassing the stories of Kernan, Boylan and Artifoni. When the user is near a tram they will hear the sound of its claxon.

Each back story, or bonus level, comes with text taken from the relevant chapter and describes a representation or presence in the interior monologue. This presence may be an image, a sound or something that Joyce directly hints at in the text. In addition to the directional prompts, this incentivizes the user to pursue specific goals, but does not lock them into certain choices. The environment switches from the city to back stories in Sandycove, Clongowes and Palestine and then switches back again to the relevant ‘Wandering Rocks’ section in the city.

The daydreaming quality of each character’s thoughts is represented by the user character being able to float around the scene in an unrestricted first-person perspective, rather than the more confined space of the city. When the user clicks on the text menu they are returned to the wider environment (which has been
changed by their interaction in the back story level) and is encouraged to look for other interaction events, which again reveal further dimensions of the story. In the flow chart below one set of connections and interaction outcomes, and the paths needed to unlock them, is represented (see Fig 4.14).

Fig 4.14 The ‘multi-linear’ connections
The following sections will demonstrate how the interactive elements of the *I-Ulysses* environment work. In the last section a brief overview of the environment and an itinerary of the elements involved in the running process were provided so as to better contextualize how these elements provide an enhanced sense of interactivity for the user. The specifics of what interactivity means will be discussed here, in the context of designing a learning environment scenario for the user. The section will show how this engages the user and encourages serious learning through the use of game development media. As part of this section, the specifics of how this interactivity meshes together with the interactive technological features explored in *I-Ulysses* will be further developed. In the ‘Itinerary’ section and the technical Appendix, a short technical account will be given of the environment’s construction.

The interactive elements of the environment help to provide a new means of understanding *Ulysses*. In the environment certain events, such as the back stories and thought bubbles, will appear at different times, depending on the choice of objectives that each character attempts to complete. This is illustrated with the time-keeping function of the clock, used to suggest that certain assets or Prefabs in the running environment can alter depending on user choices. In the city-version of the environment the camera also changes its depth of field and moves closer or further away from the user depending on which character they are using,\(^ {27} \) indicating that several different points of view on the environment are possible simultaneously. The thought bubble enables the user to see what Bloom is thinking.

\(^ {27} \) Patrick Dignam Jr. has the narrowest depth of field, being the shortest character.
based on the objectives and back stories which he has completed; the segments concerning Stephen outside Trinity for example. The alternate view port in the bottom right hand corner of the screen can also show other character’s paths, like the path of Stephen Dedalus and the car. These features more fully realize the interactive potential of the virtual reality by mirroring the interior monologue and multi-linear storytelling techniques directly.

The setting enforces the user’s sense of having a distinct goal or objective, because their choices are resulting in visible changes to the environment and will affect what level they progress to, whilst others will not. This encourages the user to be more engaged with the environment because they will be seeing a direct effect. This provokes more interest in learning about the network that underpins the character’s relationships. As shown above, completing these interactions in a particular order will change the outward environment and the possibility for new interaction events to occur within specific missions. The environment emulates these effects in real-time, so that choices percolate down to the user’s understandings of chronological time and the overall structure of the environment. It draws the user’s attention towards the system governing their immediate interactions within the environment as part of a wider overall context, as Joyce did with the story of *Ulysses*.

This real-time effect foregrounds the objectives of the environment; it focuses specifically on what drives or motivates the player in the environment and what mechanisms are being used to direct their attention. The real-time effect also focuses on how to make the user aware of the fact that they are being directed
towards discrete learning goals, having both a specific and general goal. The objective-based environment is themed around Joyce’s use of key sound events and so the environment uses certain cues or tropes from Joyce’s work, namely representing how sound cues interact with the interior monologue and multi-linear storytelling techniques. Use of songs mentioned in Joyce’s work and advertising motifs help to establish the Victorian setting of the environment, by establishing it within the time period using references from *Ulysses*.

The main undertaking of the practical component of the PhD was to get the environment to the point where these features were testable and recognizable by a user. A user can then articulate an understanding of the book’s structure and themes, based on key associations, using sound and spatial metaphors. This demonstration process forms a key part of what the interactive features of the environment do, in a practical sense, and how these features relate to the central thesis. Creating an itinerary of the gaming environment was important in order to provide an overview of the model for the environment, the characters that will inhabit it and the overall design for the unfolding structure of the environment. A segment in the ‘New Studies’ chapter details the interaction between the testing procedure and the overall thesis and is important in developing meaningful associations between theory and practice of the project in this respect.

A technical overview of the environment’s creation follows. The main undertaking of the practice-based thesis involved moving pre-rendered 3-D city models from *3DS-MAX* into the *Unity* game engine format and making the models interactive. As part
of this process the newer city models needed a third-person navigational system, one which would contrast with the back story segments and provide different play styles. This provides the user with two worlds or modes of play to explore. In order to progress through the environment the user encounters both the first-person perspective segments (the segments in Sandycove, Palestine and Clongowes) and the third-person city segments, where the action of ‘Wandering Rocks’ takes place.

Much as Joyce used different storytelling techniques the environment uses different modes of play. The objective is to make the user feel that, in order to progress in one world, the player will need to make decisions impacting on the other. The two worlds have different aesthetic proportions, with the city being more restricted and geometrically regular, whilst the back story segments are open and freer to explore, resembling the character’s imagination, their dreams and memories. Much of the technical work done on the city model occurred while undertaking a work placement at TCD under Dr. John Dingliana of the computer graphics department: GV-2.28

The placement topic was entitled: “The direction of attention of the user in a 3-D game environment with a particular focus on the development of the city and how to better guide the user towards specific learning outcomes.” Unity was chosen as the engine to render the environment as it provided the most effective means of importing different types of virtual content, whilst preserving continuity between the two modes of the environment and their common assets. This will be discussed

28 C.f. Note A in Technical Appendix A.
further in Prefabs and Waypoints in the section below. In short, the functionality of the Unity game engine allows constituent assets used in the environment to join together creating cross-extensible assets. These assets run in either versions, or modes, of the environment. The use of Prefabs\textsuperscript{29} was the reason why Unity was chosen over a more commercially successful engine such as Unreal.

The *I-Ulysses* environment relies on a Waypoint system that governs the co-ordination of specific events and objectives that are unlocked for the user. Rather than the scenario choices for a given user being essentially A or B, the idea was to give the user a variety of paths to follow from the book. While a fundamental structure underlies the environment, based on the scenarios from ‘Wandering Rocks’ occurring in chronological order, the variations or paths within the journey expand beyond what Joyce had originally devised there. In progressing through the levels of the environment, memory of previous actions is retained and the environment imposes new conditions on user progression.

Clear instances of this are seen in changes to a character’s interior monologue thought bubble depending on where they have been previously. Different notes appear in text from different segments showing new instructions, back stories and aspects of the ‘Wandering Rocks’ chapter for the user to explore. These changes are noted on the map taking the form of a window displayed in the bottom right hand corner of the screen, which updates in real-time. Each of the events in the environment is formed by a bundle of assets which are instantiated under set

\textsuperscript{29} C.f. Note B in Technical Appendix A.
conditions; these assets are specific sound effects, graphics and text instructions telling the environment to update the map or progress to another level. For the purpose of conveying the *I-Ulysses* system as part of a focus group or test setting, it was useful to use the Prefab and Waypoint methodology as an analogy for some of Joyce’s core ideas. Like Joyce’s work, the Prefab-Waypoint system relies on combining different types of information (audible, textual and visual) and having them instantiate at key points, nodes, or junctures, in the story.30

The map displays the user’s location, the location of waypoints and the location of other characters. The user icon is represented by a dot, while the objectives are lights. The dot representing the user is brown, the dots representing the Waypoints are white and the dots representing interaction events are blue. Using this map the user can more easily find their way around the level, while also seeing what icons or tasks are currently active. The map is a GUI (Graphical User Interface) that displays user location, waypoint location and what objectives are currently active in the scene. The map interacts with the tagging waypoint system. New text can be shown on the map telling the user where to go and what to do. A similar interaction occurs with the videos from the interior monologue; the environment will play different videos depending on what the tag of the user is.

**4.4 Using the Environment**

The author has had the opportunity to test and explore some of Joyce’s writing

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30 C.f. Note C in Technical Appendix A.
techniques in each of the extracts in the ‘Learning Focus’ section through focus group scenarios, presentations and recordings of the dialogue for use in the *I-Ulysses* environment. The discussion here provides some background context to show a development from the concepts in the original text. In addition to the test groups and presentations, the author had recorded each of the following dialogue-episodes for use as dialogue in the finished environment. In carrying out the dialogue recordings a number of unique aspects of *Ulysses* were noted and catalogued, as they needed to be explained to the actors in advance of recording.\(^{31}\)

The unique aspects\(^{32}\) of the text became a template that was used for identifying the distinctive aspects of Joyce’s novel for a future student presentation and was what the test-sample attendees were assessing in the tests. Additionally the notes changed and were developed through numerous drafts as part of the focus groups and as part of presentations given over the course of the PhD. The notes and materials used in the recording sessions form a substantial component of this section, as the notes used in the earlier recordings went on to be developed into the focus group seminars. In many cases the preparations for each recording, focus group or presentation was extensive and reflected how Joyce would be taught in a classroom setting. The topics of focus here are:

\(^{31}\) It should be noted that, in addition to the recording, an objective of each preparatory session was to prepare the actors for a live reading of ‘Wandering Rocks,’ given on Bloomsday 2015.

\(^{32}\) The distinctive aspects of the text were noted as being: 1) use of the interior monologue technique, whereby the reader is given access to a character’s inner thoughts, 2) use of multiple points of view, where readers see the overall network of associations between the different characters, 3) use of technology as a storytelling device and 4) use of sound effects.
• The group experiencing the interior monologue and reading character voices through reading the book aloud.

• The presence and use of sound effect techniques in the setting, to convey sound effects from the book.

• Multiple points of view represented as dialogue between members of the group reading the book.

• The Arranger presence being explained by the tutor.

• The use of technology as a storytelling device in the context of teaching the book and the tutor then being able to use technology (the environment) to demonstrate these concepts for the class.

As part of this process, a set of prospective learning objectives for the user were developed in a curricular fashion, following the model used by Philip Race in The Lecturer’s Toolkit: A Practical Guide to Learning, Teaching & Assessment, in order to assess the practical use of the environment in a Qualitative context. Each of the following outlines was designed to reflect a specific aspect of the novel’s story. The learning objectives from the ‘Introduction’ went through a process of change and re-evaluation in respect of the ongoing work done through the user-test scenarios. The final set of learning outcomes are detailed in the ‘Conclusion’ at the end of the thesis. The levels or layers of the environment are divided into three separate modes which correspond to specific literary techniques or tropes used in Ulysses. These modes were intended to impart set learning outcomes to a user, based on the extent of their engagement with specific techniques:
• The first mode corresponds to the ‘interior monologue’ technique. This technique is represented by multiple objectives in the environment. The central device representing the interior monologue technique is a context-sensitive thought bubble. The bubble shows different images depending on what the user has done and which character they are using. The purpose of the bubble is to give the user insight into the character’s motives and thoughts in a context that runs parallel to the main content of the environment and that contrasts with the use of sound effects and dialogue, but which does not disrupt the flow of the experience. The environment separates the strands of the monologue from Ulysses in a way that unfolds the story of the book and keeps it separate from the thoughts of the main characters. This separation creates an important distinction for the user in what is thought and what is imagined, a distinction that is not explicitly clear in the novel.

• The second mode uses multiple points of view creating a multi-linear story experience for the user to explore. This technique is represented by the use of an alternate view port that appears in the bottom right hand corner of the screen. The user has the option of calling up the alternate viewport after completing specific objectives, depending on the character they are playing. Doing this replaces the map. By moving through the environment with this option selected the user can visualize the book’s narrative as a multi-linear network of connections between significant events, characters and places,

33 For example, in the tram sequence it is seen that Artifoni is thinking about music, denoted by the note. In the alternate view port the user can see the discussion earlier in the day where Artifoni was pressuring Stephen into taking up a career in music.
rather than as a simple linear progression from point A-B. The use of the alternate view port technique shows the user what other characters are doing in the environment. Because the user will progress through the environment as multiple characters this allows them to see events from a variety of different perspectives; creating an awareness of the systemization of its key events.  

- The third and final mode is the character’s back stories which have clues and biographical information that Joyce provides in the text. By using the bonus levels the user is encouraged to explore the added content. These bonus levels are themed after specific episodes from Ulysses, which may be referenced in ‘Wandering Rocks.’ The exploration of these episodes allows the user to see content outside of the specific chapter. This informs them on character’s motivations and connects together some of the main story events of the book in a way that incentivizes the user to learn more about the world of Ulysses.

While the original techniques are limited to three and each of the previous points are separated, there is also a certain degree of overlap between techniques and effects. Interactions in the back story levels may affect the appearance of the real world for example and this is made clear for the user. Each of the extracts discussed

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34 When using the environment the user can also access a simplified overview of the area, the characters and the setting in a format that represents a conventional map with highlighted goals, objectives and a secondary key screen. This teaches the user about the space, setting and goal-context of ‘Wandering Rocks’ and takes the place of the alternate view port when selected. Note that in the tram scene, where the user takes control of Artifoni, there is no option to select the map as the user is observing Artifoni thinking about the conversation he had had earlier in the day with Stephen Dedalus.
in the ‘Learning Focus’ section is adapted into a full scenario in the *I-Ulysses* environment. The scenarios are discussed in terms of the mutual interaction and engagement that occurs through the use of set learning outcomes, in a teaching and learning context.

The scenarios were developed using the theories of educational game design found in Dondlinger, Salen and Zimmerman’s work. Additional learning models employed by Garrison and developed specifically for blended learning scenarios were used in tandem with the work done on game development media. Each of the relevant presences in the text are catalogued and identified and the methods used to highlight and treat each of these presences will be discussed in an educational context. Notably, Laerd’s Purposive Sampling and Qualitative Data Analysis models were employed to conduct user-tests and interpret the data gathered as part of these tests. This testing procedure process will be further described in the ‘Testing the Environment’ section.

The ‘Testing the Environment’ section will explain how game development media was used to remediate central aspects of Joyce’s writing in each episode, paying respect to the models of Garrison and Laerd outlined in their respective segments. Both Garrison and Laerd’s models are used to develop the environment with the intention of use in the user-tests and as a platform for a prospective curriculum that would be developed in the future. This curriculum is outlined in a later section. It was important not to confuse the agenda behind the development of the curriculum, using Garrison’s work, and the user-testing scenarios. While there are
many potential areas of overlap between blended learning and the *I-Ulysses* project, there are also areas of the model that the project does not explore. These areas include the financial aspects of the model that are still relevant to the overall discussion and shape of the *I-Ulysses* research agenda, some of the models having been used as part of the feasibility study that accompanies the main thesis.

### 4.5 Testing the Environment

Focus group seminars were conducted in several locations. Results and feedback from the samples have been studied and incorporated into the current version of the environment. The testing procedure will be outlined in this thesis section, using principles established in the ‘Review’ and ‘Methodological Contexts’ chapters. The work of Randy Garrison and Laerd (see ‘Sample Overview’ section below) is referenced here, using the practical scenarios established in the Community of Inquiry model (2011, pp. 85-92), with the focus on conducting user tests in a group setting. Additionally the work of Dondlinger, referenced in the ‘Review’ is used here, namely work done on meaningful learning in games (2004, p.23), spatial learning scenarios (p.91) and narrative-based play (pp.378-91). In the ‘Results’ section, data gathered from this process will be analyzed and critically interrogated, in terms of what was learned and what the ongoing contributions of the tests to the project were.

The first user-testing sample was a group of third-level students, studying Joyce as an optional module in an undergraduate English degree at the National University of
Ireland, Galway. The students were taking a seminar in Anglo-Irish Literature; the course tutor is Dr. Mark Corcoran. The second group consisted of students taking a Cultural Studies seminar at the University of Vienna in Austria. The seminar is entitled *Remix Cultures* and focuses on a variety of post-modern media, including modern literature, comic books, films and video games. The course is offered by Paul Fagan, a tutor at the University of Vienna. The third group consisted of members of the public at the James Joyce Centre on North George’s Street. The Director of the Centre is Mark Traynor. The fourth and final group sample consisted of an intermittent number of interviews conducted with students of Computer Science at TCD.

**Sample Overview**

In each testing group, emphasis was put on integrating the play and presentation experiences of the environment and combining the student’s understanding of this with key psychological and perceptual aspects of Joyce’s work being explored. In the discussion of Garrison’s work in the ‘Methodological Contexts’ chapter, the difference between the instructional and operational aspects of the blended learning model was delineated. The discussion in the following sections focuses on the instructional aspect, by showing how a tutor might explore the segments noted in the ‘Learning Focus’ section. In this section a variety of curricular models for sharing and disseminating relevant class materials are discussed.

It should be noted that existing digital learning tools, like the Digital Companion and
E-Book format, do not require extensive authoring and, as such, a different set of operational approaches are followed for the *I-Ulysses* project. This is of relevance to the ‘Testing’ chapter. While the aim of the project is not to develop new software, in employing certain techniques with use of the *Unity* engine that would be considered specialized knowhow, or IP. This was not discussed with the sample attendees directly in most cases, but it was important to point out that the functionality of the environment was a significant aspect of the project’s development and was what the attendees were expected to assess.

The focus of the test-samples was on the operational aspects of the learning model and discussing what new knowledge the sample attendees demonstrated by interacting with it. For this reason the instructional aspects of the project were not noted in the test-samples. It was important not to lead discussions too much in the educational direction either, though it was pointed out that the environment was to be used as a learning tool. The main objective was to obtain as much data relevant to the attendee’s direct experience of the environment as possible. The Joyce-learning theme of the environment’s content was to be central; but the process was about extracting as much relevant data in the context of Joyce’s work from the learning model. Rather than asking the attendees what they understood about Joyce from having used the environment, they were asked how the environment helped them to understand it; as such the samples followed a Qualitative Data Analysis and Purposive Sampling format.

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35 *RIN*, the website format and the tools used to make the Digital Companion and E-Book formats all rely on widely available, commercial software. *RIN* itself is an open-source format; the author had access to the software through attending a workshop that Curtis Wong gave at Trinity College Dublin.
When conducting a Qualitative Data Analysis there are a number of steps that need to be taken. Firstly, the nature of Qualitative Data Analysis is that it is a type of study that interprets the raw data gathered from the study in a certain way; a Qualitative Data Analysis is looking to derive as much meaningful information from the data gained as possible and that is as relevant as possible to the subject that the researcher is testing. This is distinct from a Quantitative Data Analysis set, which represents a broad cross-section of results that may be applied to specific learning outcomes in a general way. A Quantitative Data Analysis will typically ask a more specific set of questions, which focus on establishing numbers as the data set that is evaluated from test samples, rather than asking general questions which require a high-order engagement with the content of the material, or topic of the test.

The I-Ulysses project is investigating key aspects of Joyce’s literary techniques which require a high-order of engagement from students, both in their engagement with the concepts in Joyce’s work and the aspects of game development media employed in the project. The tests also required a direct interaction between the users and the learning model. It was important for this reason, not to involve the educational or curricular aspects of Garrison’s work in developing the test scenarios, but it was still necessary to make the attendees aware that the intention of the environment was as an educational tool. For these reasons a Qualitative Data Analysis model is more appropriate for the I-Ulysses project than a Quantitative model. A Quantitative model is employed for the feasibility study that accompanies the main body of the research, but that is because the feasibility explored prospective financial and
commercial models that have accompanied the project.

Additionally the student focus groups were chosen through a process of Purposive Sampling. Laerd defines Purposive Sampling as a method by which attendees of the groups are chosen through a non-random manner, rather than representing a random sample of the general public. Purposive Sampling, as defined in Laerd, tends to go along with the Qualitative Data Analysis method or a method that blends elements of Qualitative and Quantitative data sets, because the tester is looking for specific groups or types of individual to conduct the test. The I-Ulysses project aims to address the need for a product and as such the prospective test samples for the environment would include groups who had some knowledge of Joyce, those who were interested in games and, ideally, those who had experience of both formats. The methods of choosing venues for the test samples and the manner through which the samples were advertised, whether through public or private channels, was also an important aspect of developing the testing protocols and a Purposive Sampling model was employed to that end.

Some of the attendees were not familiar with Joyce, while others did not have experience playing video games. Despite the test-sample not having a teaching focus, it was important to establish early on what the principles of the research project were. The key techniques that Joyce used, discussed in the ‘Methodological Contexts’ and ‘Review’ sections, were put on a PowerPoint and noted at the beginning of each session. Similarly the functionality of the environment was also described but coding and technical terminologies were omitted. Some parallels
were drawn between the aspects of Joyce’s work discussed in the ‘Methodological Contexts’ and ‘Review’ sections with the interactive potential of game development media.

The intention for each test was that the attendees would independently establish the relationship between the use of juncture points, or nodes of meaning in *Ulysses* through use of sound cues, multi-linear storytelling techniques and the use of the interior monologue connected with the Waypoint system. The Prefab system was not discussed, in terms of functionality or coding. Many of the attendees successfully connected the structure of ‘Wandering Rocks’ with the Waypoint system, producing an understanding of the environment resembling the flow chart from the ‘Overview’ section. For each Waypoint in the environment the attendees would connect a corresponding set of themes, sounds and back story dynamics from the chapter.

Attendees were encouraged to discuss potential models and to develop their own models for understanding the chapter, based on the real-time systemization of interaction events and sounds. They were prompted to describe the connections between the facets of game development tools and the auditory and spatial aspects of Joyce’s work. It was important to fully derive connections between the relevant notions, developing them through the demonstration and interaction with the live environment. Each test was treated as if the attendees had no prior knowledge of the book, or virtual learning environments, and the demonstration of the environment was given in a way that would not lead them to draw conclusions
about the outcome of specific interactions.

As part of the test a slideshow presentation was given. A copy of the slideshow is attached in an Appendix. The slideshow and the format of the Vienna test were developed as a collaborative effort between the author and the University of Vienna’s Paul Fagan. After being shown the slideshow, demonstrating the environment and using it for themselves the test-samples were encouraged to discuss what they had learned in the seminar. The seminars were focused on discussing the functionality of the environment, the concept of objectives and what they felt the relevance of the project for Joyce’s work was. At the end of the session the attendees filled out a questionnaire.

The goal for the tests was to have attendees see a relationship between the play-based aspects of the environment and the literary techniques that Joyce employed; connecting the aforementioned elements of the book to specific spaces and locations of the environment. A number of the attendees discussed the place and setting of the environment in a context indicating that they understood, articulating a relationship between the space and key aspects of Joyce’s work. Some attendees discussed visual models for understanding the chapter: the flow-chart model from the ‘Overview’ section, which would later be developed into the key format in the environment. The discussion of a prospective flow-chart model for the environment in the Vienna test led to the development of such a model in the ‘Overview’ section of the thesis and, by extension, the key or menu screen.
Results and Findings

The following sections will discuss what the findings of the focus groups were and how the data collected as part of the focus groups was used to create a more complete version of the environment. In the following ‘Data Clustering’ section, more detailed information will be given in terms of how this feedback was incorporated into the current version of the environment. Initial feedback from the user tests indicated that the project delivered an educational guide to *Ulysses* that would appeal to academics and casual readers of the book, but that it required the presence of a tutor or an instructor to function. The most important aspect of the *I-Ulysses* project is that while it is a guide to the book, it should function in a way that does not require direct instruction.\(^{36}\) Reflection on this process of incorporating test sample feedback is a key aspect of the *I-Ulysses* project’s practice component. A central aspect of the *I-Ulysses* project’s practice has been in revising the environment to function in a more interactive manner, using this sample feedback as part of an accumulative, reflexive process.

Data gathered during the test samples was used to restructure the environment’s aesthetic format and to improve the environment, making it a better approximation of the events of the book in an interactive setting. A particular area of focus was the navigation of the environment. Many attendees pointed out the need for a more specific navigational system, with more easily identifiable prompts for the user to follow and clearer instructions about how to progress through it. Accordingly this

\(^{36}\) While the environment is intended to be used in a teaching context it should not itself require direct instruction to function.
advice is implemented into the newer versions of the environment through use of a more manageable point and click system, lights that tell the user where to go (in an earlier version of the environment these had been arrows) and a key screen that informs the user about the order of specific ‘Wandering Rocks’ tasks and objectives.

Data Clustering

Once the slideshow and play portions of the samples were completed, a questionnaire was circulated to each of the attendees. Each of the questions was designed to focus on specific aspects of the project and whether or not the respondent felt that the environment addressed the relevant aspect of Joyce’s work in an effective way. The initial questions were about establishing the respondent’s level of familiarity with the book and video games. The template for the questionnaire was built on a prior questionnaire used to assess the commercial value of the project, part of the Enterprise Ireland sponsored feasibility study. As such a number of the questions were changed to refer directly to the more modern version of the project, but the basic format and process of conducting the sample was similar to the earlier format.

The questions were intended to extract as much data about the structuring and aesthetic quality of the environment, without leading a respondent in a particular direction. Open questions were introduced to allow the respondent to address each aspect of the environment in a format where they could respond at greater length. Some of the more pertinent responses from individual respondent’s answers will be
discussed below. In respect of the Qualitative Data Analysis model noted in the previous section, it was important to cluster data in a way that yielded the most relevant information about the project and to interpret that information based on the context in which it was being given. Originally the author had thought to use a blended Qualitative and Quantitative model.

The Qualitative focused questions would ask the attendee where they felt the areas of intersection were between the formats of the environment and the work of Joyce (which indicated an open response), while the functionality of the environment was assessed by a quantitative set of questions. However, in many cases, the results of this type of testing would be simply providing a yes or no type response to those questions focusing on the functionality of the environment, while the attendee would provide relatively little detail in the Qualitative response.

In the intermittent testing scenarios conducted at TCD all attendees indicated a high degree of satisfaction with the rendering of the environment and its functionality and navigation. This was not surprising given the specialism of the sample. For a further example of this, in the first group conducted at NUIG, five of the participants indicated that they were familiar with video games and owned either a console or a mobile device that played games similar to the I-Ulysses format. All participants agreed that a virtual adaptation based on the book could be a rewarding way to learn about Ulysses. All indicated a high degree of satisfaction with the rendering of the environment, though more detailed responses in the Open Question segments were not forthcoming from several of the participants. The central point is that a
mean sample needed to be established between those with an interest in Joyce and those with an interest in games, in terms of what they were being asked to assess.

Taking this into consideration, the format of the samples moved away from the blended Qualitative and Quantitative approach to a format that used an open discussion and a purely Qualitative assessment. The discussion revolved around having attendees address a reformatted statement of the thesis question, in essence, what they felt they were learning about *Ulysses*, or the format of the book, by using the environment. In the previous section, the ‘Samples Overview,’ a flow-chart model was indicated to be the format for the attendees to visualize, in respect of the book’s structure and the Waypoint methodology used in the environment. This type of illustration was a useful way to develop the discussion towards a specific goal, but it would be difficult to assess the flow-chart model in terms of a variable data set. So, to this end the most meaningful data was gathered in the open discussions, which are detailed below.

The general consensus from the first focus group was positive, with both the questionnaire and verbal responses during the sample indicating an appreciation for the novelty of the environment’s format and the ability to portray a multi-linear perspective of *Ulysses*’ events. This and the thought bubble technique, the samples concluded, were the strengths of the project. The discussion for this sample started

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37 Each of the points noted to be distinctive aspects of the novel (one of four) were focused on in the samples; the objective was for members of each group to establish a relationship between key features of the book and the environment’s design without needing to be prompted. Coincidentally, the feature that most sample attendees discovered was the use of the thought bubble as the interior monologue technique.
with an account of Joyce’s multi-linear storytelling techniques. Subject 1A was a student on the English course taking *Ulysses* as an optional module. In answer to the question, “what did you think of how the environment presents the events from the book,” she responded in this way:

> It (the environment) allows you to focus on the events but also thoughts and perspectives that shape the events. It makes it more meaningful and helps conceptualize the events better in a more non-linear way.

When asked further about *how* she felt the environment conveyed this sense of multi-linearity from the book, she responded:

> It helps users think about the non-linear construction of Joyce’s narrative as well as the character’s motivations and thoughts.

Subject 1B was a male student also taking the optional *Ulysses* module. As the discussion progressed from the focus on multi-linearity, the first of the four major techniques from the book, towards the use of the interior monologue, subject 1B began discussing the presence of the bubble in the scene. Subject 1B concluded that the bubble represented the interior monologue technique, without needing to be prompted to make the connection:

> Emphasis on inner thoughts and stream of consciousness important in *Ulysses* and shown well in the environment.

A third subject, Subject 1C, also made a direct connection between the bubble and the interior monologue:
Thought bubbles are really interesting. They show the interior monologue of the character well.

During the verbal discussion a number of attendees raised points relating to the environment’s structure and the eventual use outside the academic context. The central criticisms were the lack of a navigational system that was easy for the user to follow, with no clear way of progressing and no prompts to tell the user where to go at a given time. Many of the respondents felt lost in the open city and thought that the use of a map would assist them to locate specific objectives. Subject 1D noted:

Definitely needs a GTA style corner map to show locations of objectives.

While subject 1A made the point that:

A navigational map to show where the character needs to go would be extremely helpful.

The main results of focus were on navigation and the need for a map and a key. A new navigational system was introduced to the environment to make it easier to follow. This involved the use of coloured lights, which more clearly indicated the direction of objectives in a scene (see Fig 4.15). Based on this prompt a user could tell what direction to go in at a given time. Another feature introduced after this sample was the map and use of directional arrows telling the user where to go (see Fig 4.16). As part of this a title-page was developed that explained the objectives on the map to the user and provided text from the book (see Fig 4.17 and Fig 4.18).
Fig 4.15 A light showing the position of Stephen Dedalus

Fig 4.16 A directional arrow telling the player where to go

Fig 4.17 The environment map showing an active objective and an arrow
After this first group, the need for a more refined, purely Qualitative\textsuperscript{38} system of data analysis was decided on, given that the responses from the initial group had been polarized along the lines of those who had made comments on the realization of the environment (with little focus on the \textit{Ulysses} setting) and those who had noted the relationship with the book, but not commented on the functionality of the environment.

The second focus group from Vienna consisted of a much larger sample size, numbering approximately twenty respondents. Additionally, Paul Fagan created a Facebook event for the page, connecting it to the \textit{I-Ulysses} Facebook page. With this sample a greater number indicated experience with playing video games; all the respondents indicated that they had had some experience with games. Only three of the respondents had read \textit{Ulysses}, but their experience and knowledge of the book was higher than an average reader; they were specializing in Joyce, with a view to studying him at a post-graduate level. Like the first sample the test-group

\textsuperscript{38} This involved refining the questions to the point where they were purely open in nature and putting more emphasis on the discussion segment of the seminar.
immediately noted the thought bubble technique. The sample discussion began with a discussion of the bubble and what the attendees thought it might represent. Subject 2A was a student from the seminar who had indicated a high degree of familiarity with *Ulysses*; she noted the effectiveness of the technique:

> In a way the thought bubble technique is even more effective than words; thoughts are close to images. I feel this is the effect Joyce wants to create and it fits even better in a game, because there is a clear distinction between what is thought and what is real.

Unlike the first test the second group was more actively interested in the intersection points between the virtual aspects of the narrative and its relationship with Joyce, through the components of the running environment. The discussion moved on to this aspect of the project. Subject 2B was primarily interested in games and noted how, when asked about the relationship between the book and environment:

> The game filters/decodes the narrative by producing different elements... The game provides information from the book and helps to understand this complex content.

The members of the group who were less familiar with games also demonstrated an interest in this aspect of the project. ‘Subject 2C,’ who was more familiar with *Ulysses* and less familiar with games, stated:

> I thought it was a very impressive game that I – even being completely unfamiliar with video games – would play in order to truly grasp the story.

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[39] The members of this group were the first to refer to the project as a game; even though the *I-Ulysses* project has more in common with a virtual reality experience.
What distinguished the responses from this sample, particularly seen in the following attendee’s response, was that there was more of a general engagement with the context of the book in an interactive format:

_Ulysses_ itself, or at least some of the chapters seems very spatial to me, so literally moving through 1904 Dublin and being able to see (rather than imagine) some of those more spatial episodes makes it easier to understand what’s going on.

Based on suggestions made by this sample alterations were made to objectives in the environment, making them more interactive and leading ultimately to the more realized development of the Waypoint system discussed in the following sections. During the verbal discussion, the students from this sample indicated an understanding of the environment’s navigational design and objectives; their responses indicated that there was a need to galvanize or enhance the features of the environment in this respect. Initially the environment encouraged a more generic A-B structure for the user to follow, but after this test sample, a model suitable to conveying the narrative of the book was chosen. This model formed a key or a visual model through which to teach the user about both the structure of the environment and the book. This approach was taken because several of the attendees indicated the need for an instructional manual to accompany the environment, or a flow chart to denote how the order of events occurs.

The flow chart used in the ‘Overview’ section is a result of the visual map discussion during the sample (illustrations were done during the test). Also prior to this test the environment did not use the two-world dynamic explored in the ‘New Studies’
chapter (see Fig 4.19) and the explanation of objectives in the environment was more linear. The subsequent version of the environment introduced a more dynamic method of interaction with objectives; while a user’s choices lead to several possible outcomes, the association between choices and outcomes needed to be made clearer for the user (see Fig 4.20). A way of doing this was to provide a key or a menu screen telling the user where to go. Most importantly, the mechanisms underpinning user’s choices and progression are reflected by the key, connecting them to the Waypoint system and a map, making the map a useful tool for a teacher employing the environment (prior to this the use of the environment in a classroom setting had been less emphasized).

**Fig 4.19** Transitioning from one world to the other
The third focus group was conducted at the James Joyce Centre on North George’s Street in Dublin. Mark Traynor, the Director of the Centre, provided the author opportunity to use the Joyce Centre as a venue to conduct the test. Additionally, Mark created a Facebook event for the page, connecting it to the *I-Ulysses* Facebook page. There were three attendees for this test-sample; follow up demonstrations were subsequently scheduled with several of the attendees who could not make the day. The attendees of the test-sample were members of the general public, Joyce scholars and a journalist who expressed interest in the project. The format for this sample involved giving a short presentation and demonstration of the environment, having the participants use the environment, and then a group discussion that was recorded.

In the discussion, emphasis was placed on exploring the functionality of the
environment, discussing what the intentions of the project were, beyond the PhD and positioning the work as part of other projects conducted in the field of Electronic Joyce Studies. Due to time constraints several members of the sample could not attend the discussion. Subsequent to the presentation the author followed up with several attendees to discuss central aspects of the project; key aspects of the discussions are produced below.

The main topic of discussion was on the focus of the environment; whether it was an academic learning tool or a game for entertainment, with one attendee pointing out the lack of a traditional game goal. This attendee, subject 3A, was an Italian Joyce scholar who had achieved a high degree of specialization in Joyce Studies, teaching Joyce at University level:

I find myself asking, what is the goal of the game?

When asked to elaborate further on this point the attendee noted that it felt as if there was no traditional game goal:

Where is the incentive? Where is the Princess to save?

He suggested that one solution to this problem would be to introduce a time limit into certain interactions in the environment:

One thing would be for there to be a time limit for certain events, like in a traditional game.
When further questioned on his feelings about the nature of the environment, in response Subject 3A noted that if the focus of the environment was primarily educational, in terms of learning about the book, this was an area where it had delivered:

If the purpose of this tool is as a learning tool then it works. ‘Wandering Rocks’ is the perfect choice for that. ‘Wandering Rocks’ was a good choice for this project.

The subject also suggested functional changes to the environment such as making the arrows less prominent, but still clear for the user to follow (these were later moved to the map), separating out the various audio-visual cues from the environment and separating out the sound sources so that it was clear what sound was emanating from what source:

I felt that there was a lot going on the screen. The sound wasn’t terribly clear at points in the game; with all the information on the screen it might be a bit confusing for the user. Maybe use less text or audio.

Like in previous samples, the novelty of the environment was emphasized, particularly in serving as an educational learning guide to *Ulysses*. What was unusual in Subject 3A’s response was that, unlike the previous two samples, the subject’s specialism was in Joyce, but he had focused almost entirely on the virtual reality aspect of the format. He had not needed the connection to be made between the book, the setting and the visual and acoustical techniques employed in the environment; rather those connections (the interior monologue, the multi-linear
paths, Dublin setting etc.) had been obvious. The author believes that this subject and subsequently the second had made the independent connection between these phenomenon due to the inclusion of changes made at the suggestion of the previous focus group in Vienna, namely the use of a key, menu screen and visual map.

Subject 3B was a civil servant who had, at one time, been an artist in a computer animation production company. The subject had a high degree of competency in the use of animation tools and was aware of Joyce. When asked about the visual presentation of the environment the subject had this to say:

I thought the graphics were impressive. I liked the familiarity of Dublin. Seeing the parts of Dublin, like Grafton Street.

Again, as with other samples, the subject had identified the motivation and purpose behind the bubble in the scene:

I liked the movement in the thought bubbles; it was like a film reel.

The discussion then moved towards the realization of key parts of Dublin city and the aesthetic qualities of the environment:

Walking through the streets and hearing the sound effects, it was like the experience of moving through the city. The game makes you want to visit the text, to see what things mean in the narrative. You want to learn more.
Subject 3B felt that the environment delivered in terms of its presentation; being visually like a game, but like Subject 3A she also expressed an interest in the stylization and rendering of the setting, despite a lack of in depth knowledge about *Ulysses*. The setting, she reasoned, reflected aspects of the book’s narrative and themes. Like Subject 3A she noted that the environment was focusing more an educational objective, rather than a traditional game goal:

> This is more education whereas in a game you win something; with this you’re on a journey, it’s more a role-playing game.

It was noted that the environment featured a high density of audio-visual sources and formats. For instance, one of the attendees noted that the thought bubble, the map and the screen showing the position of other characters in the scene were altogether too many visual cues to follow. Following this advice the environment has separated out the various audio-visual cues. The specific cues, such as the map, corresponding to the character’s location, the directional lights, and the use of the interior monologue, thought bubble, and spatial audio events have been separated out into different layers of the environment. Now, the player can choose which they see at any given time. Audio sources also have a priority scale attached to them so that the emanation of key sounds does not conflict with the playing of songs, or other audio sources in the scene.

In addition to the focus groups the author had the opportunity to carry out intermittent testing with a number of Computer Science students at TCD. The tests
conducted with the Computer Science students yielded more typically formulaic responses. The data from these tests could be organized into either a ‘yes’ or ‘no’ response. In any case, the responses from the students were entirely positive in terms of the rendering, navigation and realization of the environment. Like the other focus groups, some students raised issue with the use of sounds, finding the environment to be overly noisy, with an abundance of visual information on the screen.

Since conducting the tests conflicting sound sources have been removed and the visuals have been streamlined into a more focused overall presentation. The navigational aspects of the environment were changed, taking advice from the samples and implementing a more manageable point-and-click system, which lets the user know what objects in the scene can be clicked on (or can be interacted with) by changing color. This and a certain amount of smoothing of the camera controls, including introducing colliders to most of the buildings in the city scene, has made the environment look and feel more comfortable to use. The key has also undergone some changes to reflect the ‘Wandering Rocks’ setting, becoming more elaborate and multi-linear in nature and interacting with the map and alternate view ports, depending on user choice. Time-limits have been introduced to a number of the scenes, for example in the car scene; meaning the character must complete the mission within a specific time to see the car. The changes have been made to make the environment feel more interactive and Joyce-themed.
4.6 Teaching and Learning Focus

A teaching outline has been designed and is prescribed in the following section for how a tutor could use the environment, based on experience gained whilst conducting the user-test presentations. The intention for the I-Ulysses project is that it will be used as part of a Joyce course and would assist the tutor in delivering a teaching curriculum involving live readings and discussion. The diagrams used in the ‘Itinerary’ section serve as an instruction manual for the tutor. The environment and manual would accompany audio-visual materials such as photographs of Victorian Dublin, advertisements, songs and maps of the street sections of Ulysses. Many of these elements are present in the I-Ulysses project and in addition to the map screen, the user can also access a key showing them which objectives are active and what subplots are in play. Accompanying the environment would be a course document. Each document contains a short list of presences in the text corresponding to the environment key. These are intended to act as a guide:

- **Interior Monologue** – Joyce’s way of showing us the inner thoughts and imagination of a character.
- **Narration** – Joyce as the narrator, telling us what is happening in the scene at any given time, comparable to stage directions in a play.
- **Dialogue** – When a character is speaking out loud, or there is a loud noise in the scene.
- **Characters** – Artifoni; Stephen; Cunningham; Power; Bloom; Kernan; J.J. Molloy; Milly Dedalus; Simon Dedalus.
• Scene – Location and Time

The following notes are an example of character bios for Artifoni, the music teacher, and Stephen Dedalus:

• Artifoni: Italian music teacher; living in Dublin; is trying to get Stephen to take up a career in music; Neapolitan accent.

• Stephen: Student; 23; one of the central characters; mother has died; melancholic; doesn’t know what he wants to do with his life; has aspirations to be a writer; just came back from a trip to Paris.

In addition to the bios and text, themes or techniques for each of the episodes and characters could be provided in advance of reading and using the environment. One of the main difficulties for readers of Joyce is in telling the difference between when a character is thinking something, or whether Joyce is narrating. This is because Joyce does not clearly mark speech in paragraphs and sometimes the context of a sentence is the only clue as to whether or not it is spoken dialogue, narrative or an imagined thought. Joyce makes the reader pay careful attention to the context of a sentence to decipher its source, or presence, in the text.

The colour coding mechanism is used to clearly divide spoken dialogue from narration and interior monologue, with yellow denoting interior monologue, blue being narration and purple being dialogue. Instances of the Arranger are noted when they occur in the text. The appearance of these extracts, the separation out of
relevant themes and the use of color coding follows the format of Michael Groden’s *Notes on Ulysses* site (see Fig 4.21). Using this system, an overview of the text can be given by the tutor to the class to prepare them for the reading.

![Fig 4.21 Michel Groden’s Notes on Ulysses](image)

In an audio-recorded format the separation of these presences in the dialogue becomes simpler to hear than to read; with different voices for each character and the narration. As part of a teaching course, access to recorded dialogue, such as an audiotape or an E-Book of *Ulysses*, is a valuable resource to a tutor. The tutor has the class read separate roles within the text; representing different characters with the tutor reading the narration. In this format the audible aspects of the book are explored by the class and the active participation of the students focuses them on the pacing and timing of *Ulysses’* dialogue. A reading of *Ulysses* requires the class to know when to pause, when to intone and how to interact vocally with other
readers. The aural aspects of the book are features that the E-Book and Companion formats exploit; having a class participate in a live reading can be an instructive and rewarding way to learn about the book.

Using an example from the environment (see Fig 4.22) it is possible to see where several of the dialogue scenes can cut together, forming a story arc that involves several of the characters and scenes from the chapter. These elements are presented so that the class can easily visualize and separate out the relevant presences in the text into a spatial scenario. By reading the corresponding segments of the chapter the class then uses the environment and sees the characters and voices in the text represented as a spatial, sequential scenario. In Fig 4.22 an example is shown from the environment involving the segments concerning Boylan, Ms. Dunne and the subplot of the horse Throwaway.

Having read from the book the class is given information about the back story of Boylan in the subplot that sees him betting on the favorite Scepter,\(^{40}\) they then take control of Boylan and as they do this they hear the corresponding segment of Ms. Dunne’s dialogue and interior monologue, juxtaposing the activity of Boylan during the day with Ms. Dunne’s opinions about it. By revealing the connection between these characters and events in a real-time setting, the environment condenses several layers of contextual meaning from the book into a compact, spatial representation of the text.

\(^{40}\) The user can clearly see footage of the Ascot Cup in Boylan’s thought bubble and in the text menu level they can see the stable of Throwaway.
Boylan places a bet on the favourite Sceptre, unbeknownst to him Bloom gave the tip Throwaway to Flynn.

This is the stable of Throwaway, the Horse that Bloom accidentally tipped on the winner of the 1904 Ascot cup.

Fig 4.22 An arc from the environment
The curriculum can be built around interactions between the I-Ulysses environment, the book and the class; as such there would need to be special affordances made in the curriculum, drawing links between facets of the environment and the structure of learning material. In this chapter a prospective outline will be given of how a curriculum designed to act alongside the environment would function and later in the ‘Conclusion’ it will be shown how this can be used in tandem with the environment. The primary learning format for the tutor would involve doing the readings, having the class use the environment and then discussing specific excerpts or story slices from the environment that they have experienced.

This allows the participants to see a virtual representation of the character that they have been reading about and then follow their path through a cross-section of the environment. In the following excerpts examples are used to give an overview of the different techniques that Joyce employed and that the tutor would be looking to describe. Rather than reproducing the entirety of the extracts, small sections of the episodes are contrasted independently to focus in on specific techniques that Joyce used and show how these techniques could be treated by the tutor. A conventional textual guide to the book tends to render the network of associations between characters in an erratic graph shape (see Fig 4.23). The I-Ulysses environment aims to help the tutor by presenting the events of the book in a hierarchy, or key menu, which can be easily accessed in the environment (see Fig 4.24).
Fig 4.23 A flow chart showing the action of ‘Wandering Rocks’

Fig 4.24 A representation of the key and how it could be used by the tutor

First Extract

This extract from the environment, featuring Almidano Artifoni and Stephen Dedalus, is a good starting point. Chronologically it is one of the first episodes of ‘Wandering Rocks’ and a list would be provided to the class, showing the order of
episodes. It is seen in the environment that Stephen and Artifoni are stood outside Trinity (see Fig 4.25) discussing Stephen’s future, that Artifoni is trying to convince Stephen to take up a career in music and that Stephen is reluctant to do so:

Two carfuls of tourists passed slowly, their women sitting fore, gripping the handrests. Palefaces. Men’s arms frankly round their stunted forms. They looked from Trinity to the blind columned porch of the bank of Ireland where pigeons roo-coo-cooed.

—Anch’io ho avuto di queste idee, Almidano Artifoni said, quand’ ero giovine come Lei. Eppoi mi sono convinto che il mondo è una bestia. É peccato. Perché la sua voce... sarebbe un cespite di rendita, via. Invece, Lei si sacrifica.

(The Italian translation of the lines is provided in the game:

“I also had these ideas,” Almidano Artifoni said, when I was young like you. And I was convinced that the world is a beast. It is a shame. Because his (Stephen’s) voice would be an asset.... Instead, it is sacrificed.”

(U, p. 219))

The episode is distinctive for a number of reasons. Firstly, there is the use of different languages; the above notes have translated them into English and the environment provides an audio-recorded example of Artifoni’s Neapolitan accent. Secondly, the episode is mostly dialogue with narration. Rather than including interior monologue early on in the episode, Joyce does not overload the reader with textual information, keeping the episode’s structure straight forward.

The environment dialogue here features three voices: one for Stephen, one for Artifoni and one for the narrator. The segment moves back and forth between the two men in the conversation while the narration creates an effective back-and-forth
rhythmical interplay, which can be heard in the environment dialogue. Finally, the scene does not require direct interaction by the user so the class can simply observe the discussion, or look at the city. The tutor would urge the class to pay close attention to the passing of the viceregal cavalcade, which was featured earlier on in the environment.

Fig 4.25 The conversation between Artifoni and Stephen is visible in the alternate view port. Note that the user has taken control of Artifoni, just after he has boarded the tram and finished speaking with Stephen.

The sound of the pigeon, the ‘roocoocooe,’ is important because it is one of the first examples in the environment of a sound effect. The significance of roocoocooe goes beyond just being a sound; it is also a reference to the Rococo style of European music. The similarity between Joyce’s word and the Rococo style of music is purposeful, in the context of the episode. This is one of the first examples of the Arranger and a conspicuous departure from Joyce’s usual style, which brings attention to its presence.
Second Extract

The next cross-section features the three Dubliners: Tom Rochford, J.J. Molloy and Nosey Flynn, talking in a pub. Rochford is manipulating an archaic record player, Nosey Flynn and Lenehan will soon head outside, heading to the Ormond Hotel:

Tom Rochford took the top disk from the pile he clasped against his claret waistcoat.

—See? he said. Say it's turn six. In here, see. Turn Now On.

He slid it into the left slot for them. It shot down the groove, wobbled a while, ceased, ogling them: six.

(U, p.222)

In these extracts, the reader is introduced to some of the first instances of the interior monologue in the environment. As Tom Rochford is manipulating the record machine his physical actions are noted by the narrator. These physical actions are contrasted with the mechanism of the record player. Tom’s thoughts about the process are interspersed throughout the narration: “say its turn six. In here, see. Turn Now On,” – it is as if he were talking to the machine, giving it directions. This portion of the dialogue is featured in both Tom Kernan and Bloom’s episodes of the environment; it reveals key relationships between several of the characters and, as they discuss Bloom, Bloom walks past places in the environment that are mentioned in the dialogue, such as the poster of Mary Kendall (see Fig 4.26).
Fig 4.26 In this story arc the user hears the dialogue in the first section while playing as Bloom. Later the user clicks on the gramophone icon as Kernan and they can see the actual discussion taking place concerning Bloom.

This arc creates an important link between events from the book, because it is an example of Joyce’s use of multiple points of view, or opinions, on the same events and characters. As Rochford changes the disks Nosey Flynn and Lenehan talk about
the mechanism; it is difficult to separate out relevant dialogue and narration, particularly when it cuts, like a film, to the description of the outside world in the following paragraph. The tutor can draw attention to these techniques by showing how the cutting-between character effects work in the environment. These extracts are also a good introduction to Joyce’s use of technology as a narrative trope and for showing how technology, as a presence in the scene, interacts with the interior monologue.

Third Extract

The next segment involves Patrick Dignam Jr. the son of Pat Dignam Sr. who has just passed away:

Opposite Ruggy O'Donohoe’s Master Patrick Aloysius Dignam, pawing the pound and a half of Mangan's, late Fehrenbach’s, porksteaks he had been sent for, went along warm Wicklow street dawdling.

It was too blooming dull sitting in the parlour with Mrs. Stoer and Mrs Quigley and Mrs MacDowell and the blind down and they all at their sniffles and sipping sups of the superior tawny sherry uncle Barney brought from Tunney’s. And they eating crumbs of the cottage fruitcake, jawing the whole blooming time and sighing.

(U, p. 224)

Of all the extracts from the environment that the tutor could use, this one has the largest amount of interior monologue, the longest in the entire chapter. Patrick’s father has just passed away and several of the characters in the chapter, including Father Conmee and Martin Cunningham, are trying to raise money as part of a
collection to get Patrick into the Jesuits. Imagery of the Jesuit School is visible in Patrick’s thought bubble (see Fig 4.27). Patrick’s episode would be used by the tutor here as it has the clearest use of interior monologue and only Patrick speaks. Where the previous extracts show examples of Joyce’s employment of technology as storytelling device, use of cinematic techniques, multiple points of view and several voices, this extract focuses more on the interior world of Dignam. Patrick’s segment is full of vivid allusions that are tied to the imagination of Patrick: a boxer fighting for instance, which is an objective in the environment that when clicked on shows footage of Bloom walking towards the book vendor on Capel Street.41

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Fig 4.27 Patrick’s Path

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41 As with the cutting between Bloom and Kernan in the second extract, Bloom’s presence in this episode is used to show the user where Bloom, when they had been playing as only a few moments before, is heading at this point in time.
In this episode Boylan’s Secretary, the young Miss Dunne (see Fig. 4.28), daydreams about Boylan as she goes about her daily work:

Hope to goodness he won’t keep me here till seven.

The telephone rang rudely by her ear.

—Hello. Yes, sir. No, sir. Yes, sir. I’ll ring them up after five. Only those two, sir, for Belfast and Liverpool. All right, sir. Then I can go after six if you’re not back. A quarter after. Yes, sir. Twentyseven and six. I’ll tell him. Yes: one, seven, six.

She scribbled three figures on an envelope.

—Mr. Boylan! Hello! That gentleman from SPORT was in looking for you. Mr. Lenehan, yes. He said he’ll be in the Ormond at four. No, sir. Yes, sir. I’ll ring them up after five.

(U, p.220)

The segment shown above makes use of several techniques already discussed in the previous extracts: use of the interior monologue, use of sound effects and use of technology as a storytelling device. The episode incorporates these techniques together in a way that develops on what the class has been introduced to in earlier segments. The narrator shows Ms. Dunne and the book she is reading. The text moves into her thoughts about the book and the line from the preceding episode (denoting the record player) appears here again. She then types the date with her typewriter, introducing another key piece of information. The action then cuts cinematically to the outside street. The tutor can set up and contrast each of these features with their appearance in the preceding chapters, making it a useful extract to finish on.
The most important aspect of the environment for the tutor to focus on is that each of the extracts works independently of the overall environment, creating a series of cross-sectional views through the daily experience of the characters. The class will still use the environment with specific goals in mind, as will any user outside the educational context; experiencing the story as a complete network of interconnecting paths. However, each episode still functions independently and is intended to demonstrate a particular technique or narrative trope for the tutor, while the various episodes still join together. It is in this respect that the environment most resembles the format of the ‘Wandering Rocks’ chapter as it represents both a number of specifically selected cross-sections of the character’s daily experience, while the sum of its parts will still work together when used as a whole.

4.7 Conclusion

The I-Ulysses environment has a distinctive learning focus and combines this
learning faculty with potentials offered by interactive game development media. The *I-Ulysses* environment creates an immersive, interactive experience. The audio-spatial qualities that game development media offers strengthen links between the learning, hypertextual and audio-spatial aspects of Joyce’s work. The project’s use of a virtual reality setting is a means to draw a player into Joyce’s work and involve them in a learning environment with a distinct set of goals and criteria for progress. This encourages involvement, participation and the play aspects of gaming, while also enabling understanding of distinctive audio-spatial aspects of Joyce’s work.

In the ‘Overview’ section a brief itinerary of the environment was provided so as to give an outline of its shape, the interaction events that it adapts from ‘Wandering Rocks,’ and the use of context-sensitive objectives for the user to follow. It was illustrated how different perspectives of play were possible and could change, depending on what character had been selected and what objectives the user was pursuing. In the *I-Ulysses* environment the player can evaluate the order in which specific events take place through exploring the back stories of several of the characters, such as Bloom, Stephen, Boylan and Kernan.

Distinctive aspects of Joyce’s writing style, his use of the interior monologue technique, use of multi-linear storytelling techniques, sound cues and technology are adapted into the virtual setting and used as cues, or tropes, for the user to explore. These Joycean literary techniques are adapted into the environment and remediated into a distinctive set of virtual-learning goal paradigms. The meshing of the technical aspects of the environment’s design, with its learning focus and Joyce-
themed content creates a unique research contribution in several fields. As part of the broad research agenda of the project, it is necessary to assimilate and interpret data from a wide variety of sources: including the test samples, prospective curricular models and ways of distributing and commercializing the I-Ulysses environment. Throughout this process the fundamental research question is highlighted by continually returning to the original four techniques in Ulysses which suit adaptation into a spatial, virtual setting: the interior monologue, multiple points of view, back stories and the use of technology and sound as a storytelling device.

In recent years the use of virtual environments and play based methods of learning has gained a credible reputation amongst the academic community; a variety of diverse fields such as Neuroscience, Medicine and Cultural Theory have embraced the virtual learning model. Games motivate players to spend time on tasks, mastering the skills a game imparts. A number of distinct design elements, such as narrative context, rules, goals, rewards, multisensory cues, and interactivity can stimulate desired learning outcomes (Dondlinger, 2007, p.26). ‘The New Studies’ chapter has looked at the use of a virtual learning model and the use of virtual tools to adapt Joyce’s ‘Wandering Rocks’ into an innovative new learning format. The chapter has explored the potential for use of game development media in an educational context, highlighting the use of specific techniques in order to adapt literary narrative into a complex, multi-faceted virtual learning experience.
Conclusion: the I-Ulysses Environment

5.1 Overview of the Thesis

In the ‘Review’ and ‘Methodological Contexts’ chapters specific projects and methodologies were used as models to position where the I-Ulysses project aims to contribute new knowledge, while the ‘New Studies’ chapter discussed how this was to be done using new techniques. The research question of the project underlines a number of key points related to the use of a virtual reality model for understanding Ulysses. There are several central points, areas of connection and distinctive ways that a virtual adaptation can treat specific aspects of the book. These areas reference four specific techniques that Joyce used in Ulysses: the interior monologue, multiple points of view, back stories and the use of technology and sound as a storytelling device.

At several junctures throughout the thesis these techniques were related to a set of learning objectives or principles for how the techniques would be adapted in the virtual environment and how a student of the book would use the environment to situate and see the employment of those techniques in practice. The points are linked to the distinctive storytelling aspects of Ulysses that Joyce employed, creating a set of relationships and hierarchies between Ulysses’ characters and his rendering of Dublin; this hierarchy makes the book a complex and multi-faceted reading experience. It was noted how each chapter of Ulysses has its own unique style and that these facets of the novel are suited to a virtual reality adaptation, in which a
variety of different visual, acoustic and spatial learning cues can be assimilated. The research question asked:

Can a virtual reality adaptation facilitate the user’s understandings of the innovative storytelling techniques that Joyce employed in ‘Wandering Rocks?’

‘Wandering Rocks’ is the chapter that the environment adapts on account of its links with other key moments and characters in the book and for being the chapter in *Ulysses* where the distinctive features of Joyce’s writing style are most abundant.\(^{42}\) The choice of a virtual reality format has the distinct advantages of separating the spoken word from narration, enabling the user to know the difference between thoughts and reality and this juxtaposition is a key theme of Joyce’s work. One of the main objectives of the project was to demonstrate for the reader how a virtual model is both an effective means to adapt the techniques that Joyce employed into an easily understood format and as a vehicle to help deliver a curriculum based on *Ulysses*. The environment remolds and remediates each of these techniques into a multi-linear, spatial and hypertextual virtual design.

5.2 *Theory and Practice*

The central objective of this section is to show how the *I-Ulysses* educational model outlined in the previous chapters could be used in practice. This subchapter uses

\(^{42}\) It is also the only chapter of *Ulysses* that features all the characters in the same place at the same time and that references settings throughout the rest of the book.
some of the examples of the teaching techniques discussed in the ‘Using the Environment’ section of the ‘New Studies’ chapter and Garrison’s discussion of the operational and instructional tenets of the COI, noted in the ‘Methodological Contexts’ chapter. For the purpose of this section, the commercial underpinnings of the project are left for an Appendix. As part of the project, the author undertook an Enterprise Ireland sponsored feasibility study in 2014 to assess the value of spinning the project out into a commercial start-up. During this process some valuable resources were developed to assist in developing the marketing and distribution platforms of the environment. This process will also be transcribed in an Appendix.

Some of the content developed for the feasibility is of direct relevance to this section, particularly areas of resource management in an e-learning curriculum, which Garrison points out as being a topic of the blended learning framework (p.143). One of these resources was a promotional Facebook page (see Fig5.1) that linked to a survey about the project. The page is used here as an example of an e-learning resource that could be useful to a tutor using the environment in an educational context. In its current format the page shows images and videos from the environment, but could be expanded into a more diverse range of formats, including maps, reading materials, interviews with scholars, other linked data images, music and recordings of the book being read.
It was previously shown how the tutor would draw student’s attention towards Joyce’s use of the interior monologue technique to focus on the experience of different characters by going inside their stream of consciousness. The tutor would discuss each of these presences and have the students read through the book, as characters from the novel. After they played through relevant segments of the environment they could later go online, consult the relevant section of the website and discuss what they had learned in class that day. Each of the relevant presences in the text would refer to a specific Waypoint in the environment and break down the significant themes and tabs in the interior monologue section.

The class could look up the relevant headings in the interior monologue tab, which the tutor or students in the class could regularly update (see Fig. 5.2). The involvement of the group in this manner creates a learning community, which can tap into already vast online resources devoted to Joyce. This functionality complements features from the environment; for example, embedded in the
environment is a recording of *The Croppy Boy*, a representation of a gramophone, footage of the Royal Ascot Cup and images of Gentleman Jim Corbett from Patrick’s interior monologue, forming a multi-media resource. Each Waypoint from the environment refers to a specific theme or technique from the book and the imagery and sound effects can support the structure of set learning themes in a way that complements the environment’s key screen (see **Fig 5.3**).

**Fig 5.2** An example of the Interior Monologue tab, with Waypoint hyperlinks shown below it.
Examples in the ‘Using the Environment’ sections were cited from the stream of consciousness of Patrick Dignam, the secretary Ms. Dunne and Tom Rochford in the pub. In each case of Joyce’s use of the interior monologue technique in the book it was shown how the technique could be conveyed to the class. Key aspects of the character, such as their motives, what the specific character was thinking and giving clues as to why they may think in a particular way draws attention to the different character’s points of view and uses multi-linear storytelling techniques. The key to Joyce’s use of the monologue is the joining together of different character’s points of view, which he does through the overarching presence of the ‘Arranger.’ By hosting these elements in a network that the student can easily visualize as part of the key screen, it makes the format of the book easier to understand and creates a cognitive link between the space of the environment and the themes of the book.
In the book the Arranger gives hints and clues as to its presence: subtle alterations in Joyce’s use of the style that he developed, the interior monologue and examples of this were noted in the use of the pigeon sound and the operation of the record machine. The Arranger is an analogue for Joyce, the designer and architect of *Ulysses*, connecting ideas and motifs together in a hyperlinked order. The techniques that Joyce employed naturally lend themselves to an electronic learning context. The presence of the Arranger organizes the narrative into different strands and builds the story around an assumption that the reader will follow the book’s pattern, trying to learn more about *Ulysses* by solving its puzzles.

The designer of the environment is comparable with the Arranger, as they are trying to visualize the narrative through connecting sound and spatial geometry in a way that illuminate its presence as the narrative architect of the text. With use of game development tools the separation of the different narrative strands through use of context-sensitive thought bubbles and multiple views through the same space will enhance participatory engagement with *Ulysses*. The ability to provide imagery, music, dialogue and hyper-linked content can facilitate the Community of Inquiry paradigm of the blended learning methodology. With the environment it becomes possible to provide actual examples of Joyce’s use of sound effects and his use of technological tropes as storytelling devices.

Specific examples of the technology, such as the trams, the gramophone and phone conversations can be provided in a spatial setting, facilitated through use of the game engine. Key points where the technology fits into and complements the other
techniques, such as the use of the interior monologue and switching between characters, can be structured in a way that complements the experience of reading the novel. With the addition of the virtual format, the user gets to see the relevant scenarios unfolding in real-time as they play them.

5.3 Results and Findings

The concepts discussed in the extracts from the book and the ‘Using the Environment’ section form part of the instructional mode of the blended learning framework. Instructional imperatives are those that involve the tutor’s guidance and mentoring of the class through the curriculum. The operational imperatives are those that refer to the student’s use of the tools involved in a blended learning scenario. The operational imperatives were developed into practical scenarios in the ‘New Studies’ chapter, showing how the student will approach each task, or objective, in the environment and what they will learn through this interaction.

The benefit of having an interactive virtual model is that its use emphasizes the participatory learning dimensions of the blended learning framework. It gives the tutor a format that is a step beyond what is possible with the Digital Companion or E-Book format because it is interactive and recursive. The objective of the instructional imperative of the blended learning model is for a tutor to be involved, as much as possible, in guiding the class towards discrete learning goals. The I-Ulysses project, for this reason, ultimately represents a model or a tool that a tutor can employ alongside a teaching curriculum, but is not designed to replace a
conventional curriculum or provide an alternative form for it. The primary goal of the *I-Ulysses* project is that it functions independently as a virtual environment that a user can interact with and learn about Joyce’s work from. This means that the operational aspects of the environment require a different set of developmental criteria from what would be involved in developing an educational website, an E-Book or a Digital Companion.

The *I-Ulysses* environment has a virtual design emphasis, unlike the Digital Companion and E-Book formats. By engaging with the environment, the user learns about the book through the design elements of the environment. While a tutor is interacting with the environment or using it as part of classroom activity, such as a reading, they can focus in on specific facets of the book while not disrupting the flow of the experience. The virtual scenarios were based on the author’s interaction with students and tutors who have taught Joyce.

As the thesis’ arguments progressed it showed specifically what new learning is possible using a virtual reality adaptation of Joyce’s work. Conversely it was also important to consider the areas where the remediation of Joyce’s text was difficult and what new approaches the project took to adapt them in the virtual medium. Where the thesis discussed these areas it emphasized possible areas for improvement; new additions were made to the environment in response to suggestions made by the focus groups in the ‘New Studies’ chapter. The main additions made to the environment were; the use of a more complete navigational system including a map; development of directional prompts, such as lights and the
point-and-click system; and the use of a Waypoint system and a key, whereby users would see and experience the order of events in a more developed fashion. The separation out of audio-visual textures and text in the environment was also an important contribution made in response to the focus groups’ suggestion.

In the ‘Introduction,’ it was noted that the main objective of the environment would be to facilitate the user’s understandings of the innovative storytelling techniques that Joyce employed in ‘Wandering Rocks.’ In the ‘Introduction’ and ‘New Studies’ chapters a set of prospective learning outcomes was discussed. This list of learning outcomes was derived by compiling each of the unique storytelling devices employed by Joyce and dividing them into three broad effects or modes: the interior monologue (or thought bubble), the multi-linear storytelling technique and the use of back stories. The responses of the attendees from the focus groups created a re-evaluation of the initial stated learning outcomes, referred to now as learning objectives. By interacting with the environment the users from the groups were better able to:

- Note the difference between interior monologue segments from *Ulysses*, the dialogue and the environment in a visualized, aural context.
- Discern the character’s motives, in an educational context.
- Explore the back stories of each character in a way that connected their shared experiences to the wider environment of the city.
- Discover more about the cultural world of Joyce’s *Ulysses* and Joyce’s main works, in an educational context.
- Describe a multi-linear perspective on the events of the chapter, rather than focusing on a single story-facet at one time in one place.
- Describe the events of ‘Wandering Rocks’ in a way that emphasized the space, setting, use of sound effects and the interconnectedness of key events and characters from the book.
- Evaluate how Joyce used sound to connect events across different spatial, geographical and temporal locations in the city.

The respondent samples stated that being able to see the difference between the character’s imagination and reality, while having corresponding thought bubbles to delineate these elements of the experience, made the experience more enjoyable and informative in the context of seeing the technique represented from the book in a virtual format.

The respondents also argued that they felt the use of the map and the presentation of the city provided a good overview of the space of the book and the character interactions occurring in it. The consensus was that the environment, from a graphical point of view, made an effective use of the urban environment and that it felt as if the user were walking around the actual space of Dublin. A respondent from the Vienna test noted that the ability to see the streets of Dublin in a visualized context, while also exploring the narrative of the book, made the experience of using the environment more engaging and was comparable to a walking guided tour of the area.
One of the primary areas of difficulty in the project was assessing and operationalizing the data extracted from the focus groups. In many cases the types of data gathered in the project were not formatted for a statistical evaluation; rather than exploring the mean data, information and insight gathered was more anecdotal than procedural. As Sandoval, McKenny and Reeves argue, a virtual reality format lends itself to novel forms of education-design; but because the subject matter of the I-Ulysses project is esoteric, specifically in relation to Joyce’s work, it is more difficult to assess the output of the project in a scalable format like the Conjecture Mapping discussed in the ‘Methodological Contexts’ chapter (see Fig 5.4 below).

Fig 5.4 Sandoval provides an example of the previous Educational Design Conjecture Map that has gone through the ‘Iterative’ process.

Where the mapping format and education-design theories were useful, however, was in providing the template for an ‘Iterative’ design process, whereby the process and practice of the project underwent significant revision, which integrated a
discourse involving both the content of Joyce’s work and the employment of virtual reality technologies. This is ultimately why the project benefited from having explored commercial and technological underpinnings, in the EI-feasibility study and academic placement, because they provided an opportunity to test the design-hypothesis and High-Level Conjecture of the project in a real-world setting.

Without this data and the data gained from the focus groups, the project might potentially have only focused on a single facet of the design-hypothesis at a given time. Where the *I-Ulysses* project sought to break new ground was in offering the potential for the design-process to be externalized into the format of the learning environment; incorporating both the Joyce-focused and technology-focused aspects of the project simultaneously. This externalization provided another layer of engagement that reflects the type of continuous and recursive engagement that readers traditionally have with *Ulysses*. The learning environment can aid the efforts of a tutor attempting to teach *Ulysses* in a classroom environment by facilitating recursive engagement, while mediating the multi-modal content of the book.

There are also potential areas for improvement in the *I-Ulysses* project; in terms of design emphasis and methodological focus, the primary objective of the project was to establish a functional interface for the implementation of 3-D ‘game’ assets that would resemble and reflect key elements of the content of *Ulysses*. However, there are other areas of the project that could be focused on, in a more developed format. One such area is the use of sophisticated rendering technology to reproduce an architecturally authentic ‘Georgian-era’ Dublin, for the benefit of tourism and
cultural heritage. In Fig 5.5 below examples of what the environment could look like are shown using models developed by NOHO as part of their pre-1916 Virtual Dublin Project and a model of Christ Church.  

Another area that the project could have emphasized more was the granularity of the game-assets employed in its development; furthermore, the manipulation of its pre-existing hierarchy, whereby tutors could update the system in real-time and instantiate instances of player avatars or ‘thought-bubbles,’ reflecting their own educational design-architecture and the student’s engagement with the content. In the formats indicated in Fig 5.7 and 5.8 below, it would be possible for the tutor to update modules for player avatar appearance; what the thought bubbles would show and to re-format aspects of the environment’s design and realization, reflecting an ongoing discourse.

The data employed in this hierarchy would allow such to occur in an online server-based context, thus expanding the horizons of the project into something more closely resembling an online community, or an archive or repository of digital knowledge maintained by its subscribers. This educational-design architecture maps key features of the educational-design curriculums proposed by Sandoval, McKenny and Reeves; positioning them in a live, practical context, which could conceivably connect with other online resources.

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43 Reproduced courtesy of Severnpartnership.com (Retrieved from URL: http://www.severnpartnership.com/case_study_item/dublin-cathedrals-3d-modelling/)
Fig 5.5 Bloom walking around Georgian-era Dublin Castle and Christ Church.
Fig 5.6 The *Unity* Interface

Control of the Character
- Thought Bubble
- Player Avatar

Educational Design Interface
- User Manipulates Elements
- Can Update Design Architecture in Real-Time

Unity Interface
- Prefab Heirarchy
- Modular Design

Fig 5.7 Map of ‘Key Elements’ that the user can instantiate
5.4 Conclusions

The main objective of the project was to explore new ways for a user to learn about aspects of Joyce’s work, using a virtual model. The project adapted key aspects of Joyce’s storytelling techniques and made them conceptually easier for a user to understand. The scenarios that the user learned about were described and discussed; the techniques that the environment adapted were noted and catalogued in the ‘New Studies’ chapter. The environment thus is aimed to be helpful to a tutor on a course teaching Joyce, but it is also intended to be an entertaining experience that can be used as a virtual reality experience.

Feedback from the user tests indicated that the project delivered in providing an informative, educational guide to Ulysses that would appeal to academics and casual readers of the book. The most important aspect of the project to emphasize, however, is that while it represents a guide to the book, it is also primarily a virtual reality experience. The project researched the areas of overlap between game media, virtual reality and literature. In this regard it could form an effective template for adapting different kinds of literary narratives into virtual reality formats. The practical work done on the project was about demonstrating how to do this most effectively, with the most efficient use of resources possible.
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Technical Appendix A

**Note A:** Aspects of the game engine functionality explored in the placement included: exporting of rigged mecanim animation models into *Unity* and the use of specific textures and geometry from the *3DS-MAX* city assets. It was necessary to investigate the viability of moving the large models into the game without taking up too much disk space or RAM. A method was used that significantly reduced the overhead of rendering the models; exporting and saving the city models and their textures in *Unity*.fbx and .fbm formats respectively rather than as native *3DS-MAX* files in the .obj format.

**Note B:** ‘Prefabs’ are a generic feature of games engines that allow a developer to group game objects together into packages that can be quickly instantiated in the game environment. These packages are employed in situations where they can lighten the load on the processor and enable reusability of the assets employed in development. This functionality enables a convenient hypostasis effect referred to as inheritance, where the designer can implement changes to a specific asset or can make changes backwards compatible to all instances of an asset. In *Unity3D* Prefabs designated in the Hierarchy view hold an active reference to the Prefab even when they are not being rendered by the engine.

The inheritance functionality affects the way Prefabs are rendered by the engine. The engine decides what instance of a Prefab to instantiate based on instructions predicated in the Hierarchy and through use of scripting. The engine will then
decide how to instantiate a Prefab based on these instructions and will make that decision from how instantiation will affect other instances of a Prefab, even those not being used in a scene. Sometimes the engine will derive specific operations in temporary memory, in order to facilitate the instantiation of several Prefabs. The intention of the system was to make the Unity engine as autonomous as possible, requiring little coding by the developer outside Unity’s native MonoDevelop suite.

A careful designer can use the system to significantly save memory if the bundles of Prefabs have pre-determined execution subroutines. For most commercial engines the emphasis is on increasing speed of execution and rendering, rather than prioritizing on the engine’s use of memory, in both short term and long term operations. This feature is useful in a setting where multiple operations occur at different times and need to be coordinated, prolonged, or prioritized over the execution of others, like in the I-Ulysses project. Modern games achieve a more extensive means of asset co-ordination by employing multiple threads of code. The computer game industry has a focus on creating console CPU’s with more cores that can execute more threads.

With the use of Unity Prefabs it becomes possible to create variations in running procedures responsible for the simultaneous generation of graphics, sound, text and the loading of new scenes, without the need for multi-threading. When creating multiple levels and an unfolding structure this functionality is highly useful, especially when working in a format with limited overhead, like i-phone or other portable device. This is the type of graphical interface that the I-Ulysses project
employs; the finished environment could be run on a variety of smaller formats, such as i-phone apps or on i-pad, or other smartphone formats.

**Note C:** Each ‘Waypoint’ is represented by an object or asset in the running environment. These are designated as a Prefab. Each waypoint has a script attached to it listing it as an array, with a specific position for the waypoint in the city so the game object does not need to be represented in the Hierarchy. This script has a collider function which tells the object to destroy itself when the player tagged as Player moves into proximity with it. The script then instantiates another object, a second waypoint, which is also part of the array. This Waypoint update function has a similar instruction that updates the current waypoint number to a variable integer (0-1 ...) representing the waypoint, and which changes the player tag to something different. Depending on the tag of the player, different outcomes are observable in the position of the waypoints; directing the user’s navigation through the environment. This is done in real-time by updating the waypoint location in a straight line, or displaced across several locations.

As all paths still lead to the same outcomes in terms of the interactions and the levels to which they lead, this means that the player will go in one of several directions following the waypoints, like a conventional narrative. In subsequent levels of the environment these tags govern a sophisticated range of interactions such as what the map displays, what imagery plays in the character’s thought bubble, or the emanation of sound effects. The player perceives that there are a larger number of outcomes, derived from a small number of player choices within
each level. There are not an infinite number of actions in the environment, but the cross-extensibility of sound, spatial and text-based information, immerses the user in the environment: as J.M. Dondlinger states, “effective game design gives players the perception they have free will, even though at any time their options are actually quite limited (2009).” The tagging system is employed in commercial games to facilitate a wide variety of data variables, in the I-Ulysses environment it is used to govern the interaction between different sets of audio-visual and acoustical information.
Appendix B

Slide Show Presentation

The following slideshow presentation was developed by Paul Fagan of the *University of Vienna*, for the purpose of the student test-sample.

![Slide Show](image)

**Fig B.1** The Tower; Introduction
"I wrote Ulysses, what did you do?"

Fig B.2 Overview of Joyce

“to the uninitiated it appeared that Mr Joyce had taken some half million assorted words [...] shaken them up in a colossal hat, laid them end to end” (First issue of TIME, 3 March 1923)

Fig B.3 Introduction to Joyce’s Style
Fig B.4 Examples of other projects: Joyce in Images

Fig B.5 Overview of Dublin
Fig B.6 Images from 1904

Fig B.7 Introduction to *Ulysses*
— Mkngnao!
— O, there you are, Mr Bloom said, turning from the fire.
The cat meowed in answer and stalked again stiffly round a leg of the
table, mewing. Just how she stalks over my writingtable. Prr. Scratch my
head. Prr.
— Mrkngnao! the cat said loudly.
He watched the bristles shining wirily in the weak light as she tipped
three times and licked lightly. Wonder is it true if you clip them they
can’t mouse after. Why? They shine in the dark, perhaps, the tips. Or
kind of feelers in the dark, perhaps.
He listened to her licking lap. Ham and eggs, no. No good eggs with this
drought. Want pure fresh water. Thursday: not a good day either for a
mutton kidney at Buckley’s. Fried with butter, a shake of pepper. Better a
pork kidney at Dlugacz’s. While the kettle is boiling. She lapped slower,
then licking the saucer clean. Why are their tongues so rough? To lap
better, all porous holes. Nothing she can eat? He glanced round him. No.

Fig B.8 Use of Sound

— Mkngnao!
— O, there you are, Mr Bloom said, turning from the fire.
The cat meowed in answer and stalked again stiffly round a leg of the
table, mewing. Just how she stalks over my writingtable. Prr. Scratch my
head. Prr.
— Mrkngnao! the cat said loudly.
He watched the bristles shining wirily in the weak light as she tipped
three times and licked lightly. Wonder is it true if you clip them they
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He listened to her licking lap. Ham and eggs, no. No good eggs with this
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mutton kidney at Buckley’s. Fried with butter, a shake of pepper. Better a
pork kidney at Dlugacz’s. While the kettle is boiling. She lapped slower,
then licking the saucer clean. Why are their tongues so rough? To lap
better, all porous holes. Nothing she can eat? He glanced round him. No.

Fig B.9 Use of Interior Monologue
Fig B.10 Map of Wandering Rocks

Fig B.11 Google Street View
Fig B.12 Use of Technology: Phones, Trams and Cars

Fig B.13 The noise of the Tram from ‘Lotus Eaters’
Must be the cider or perhaps the burgund.
Bloom viewed a gallant pictured hero in Lionel Marks's window. Robert Emmet's last words. Seven last words.
WHEN MY COUNTRY TAKES HER PLACE AMONG.
Prprpr.
Must be the bur.
FFf! Oo. Rrr.
NATIONS OF THE EARTH. No-one behind. She's passed. THEN AND NOT TILL THEN. Tram kran kran kran. Good oppor. Coming. Krandelkran kran. I’m sure it’s the burgund. Yes. One, two. LET MY EPITAPH BE.
Kraaaaaa. WRITTEN. I HAVE.
Prppfrfrrpppp.
DONE.

Fig B.14 Above scene broken down into ‘Presences: Interior Monologue, Narration, and Sound’

<table>
<thead>
<tr>
<th>TITLE</th>
<th>SCENE</th>
<th>HOUR</th>
<th>ORGAN</th>
<th>ART</th>
<th>COLOUR</th>
<th>SYMBOL</th>
<th>TECHNIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Telemachus</td>
<td>The Tower</td>
<td>8 a.m.</td>
<td>History</td>
<td>Anatomy</td>
<td>Brown</td>
<td>Horse</td>
<td>Ciceronian</td>
</tr>
<tr>
<td>2. Nestor</td>
<td>The House</td>
<td>3 a.m.</td>
<td>Kidney</td>
<td>Botany</td>
<td>Orange</td>
<td>Nymph</td>
<td>Narrative</td>
</tr>
<tr>
<td>3. Proteus</td>
<td>The Orchad</td>
<td>11 a.m.</td>
<td>Heart</td>
<td>Botany</td>
<td>White</td>
<td>Euclidean</td>
<td>Nicias</td>
</tr>
<tr>
<td>4. Calypso</td>
<td>The Rock</td>
<td>3 p.m.</td>
<td>Muscle</td>
<td>Psychology</td>
<td>Black</td>
<td>Fabian</td>
<td>Ictyian</td>
</tr>
<tr>
<td>5. Leucippos</td>
<td>The Boat</td>
<td>4 a.m.</td>
<td>Ear</td>
<td>Music</td>
<td>White</td>
<td>Editor</td>
<td>Euhemochron</td>
</tr>
<tr>
<td>6. Hades</td>
<td>The Rock</td>
<td>5 p.m.</td>
<td>Eye</td>
<td>Eye</td>
<td>White</td>
<td>Poet</td>
<td>Enigeian</td>
</tr>
<tr>
<td>7. Aeolus</td>
<td>The Temple</td>
<td>3 p.m.</td>
<td>Eye</td>
<td>Eye</td>
<td>White</td>
<td>Poet</td>
<td>Enigeian</td>
</tr>
<tr>
<td>8. Lysistrata</td>
<td>The Rocks</td>
<td>4 a.m.</td>
<td>Eye</td>
<td>Eye</td>
<td>White</td>
<td>Poet</td>
<td>Enigeian</td>
</tr>
<tr>
<td>9. Scylla</td>
<td>The Library</td>
<td>5 p.m.</td>
<td>Eye</td>
<td>Eye</td>
<td>White</td>
<td>Poet</td>
<td>Enigeian</td>
</tr>
<tr>
<td>10. Wandering Rocks</td>
<td>The Streets</td>
<td>3 p.m.</td>
<td>Blood</td>
<td>Mechanics</td>
<td>White</td>
<td>Poet</td>
<td>Enigeian</td>
</tr>
<tr>
<td>11. Street</td>
<td>The Street</td>
<td>3 p.m.</td>
<td>Blood</td>
<td>Mechanics</td>
<td>White</td>
<td>Poet</td>
<td>Enigeian</td>
</tr>
<tr>
<td>12. Cyclops</td>
<td>The Concert Room</td>
<td>4 p.m.</td>
<td>Ear</td>
<td>Music</td>
<td>White</td>
<td>Poet</td>
<td>Enigeian</td>
</tr>
<tr>
<td>13. Nausicaa</td>
<td>The Rocks</td>
<td>5 p.m.</td>
<td>Eye</td>
<td>Eye</td>
<td>White</td>
<td>Poet</td>
<td>Enigeian</td>
</tr>
<tr>
<td>14. Oenone of the Sun</td>
<td>The Hospital</td>
<td>11 p.m.</td>
<td>Rush</td>
<td>Medicine</td>
<td>White</td>
<td>Poet</td>
<td>Enigeian</td>
</tr>
<tr>
<td>15. Circe</td>
<td>The brothel</td>
<td>11 p.m.</td>
<td>Love</td>
<td>Magic</td>
<td>White</td>
<td>Poet</td>
<td>Enigeian</td>
</tr>
<tr>
<td>16. Ulysses</td>
<td>The Shelter</td>
<td>1 a.m.</td>
<td>Nerves</td>
<td>Navigation</td>
<td>White</td>
<td>Poet</td>
<td>Enigeian</td>
</tr>
<tr>
<td>17. Ithaca</td>
<td>The House</td>
<td>1 a.m.</td>
<td>Nerves</td>
<td>Navigation</td>
<td>White</td>
<td>Poet</td>
<td>Enigeian</td>
</tr>
<tr>
<td>18. Penelope</td>
<td>The Red</td>
<td>11 p.m.</td>
<td>Love</td>
<td>Magic</td>
<td>White</td>
<td>Poet</td>
<td>Enigeian</td>
</tr>
</tbody>
</table>

Fig B.15 Ulysses’ Chapters broken down into themes, based on the ‘Gilbert Schema’
Research Question

“Can a video game adaptation of Ulysses leverage new understanding of distinctive aspects of Joyce’s writing style and narrative techniques?”

**Fig B.16** What the Research Question is
Questionnaire

The following questionnaire was developed for the purpose of the test-samples:

Questionnaire for I-Ulysses

1. When you read Ulysses were there any distinctive aspects of the style, narration or storytelling techniques that you felt made the experience of reading it different from other books? (Please provide more information in A.1 focusing on how you experienced reading the book, in contrast with other novels)

A.1

2. At what points in the book did you feel these techniques stood out the most, or were most distinctive, can you describe them? (Please provide more information in A.2)

A.2

3. Did you think that the book was difficult to read, were the techniques that Joyce used hard to grasp? (If so please provide more information in A.3 about what the difficult aspects of the book were)

Strongly Agree    Agree    Disagree

A.3
4. Have you used a guidebook for *Ulysses* or studied the critical literature around it? (If so please talk about how other books helped you understand the novel, or if you have not found them helpful talk about that)

A.4

5. Have you seen a film adaptation of *Ulysses*, or listened to a *Ulysses* audiobook (Strick's 1967 *Ulysses*, Sean Walsh's 2003 *Bloom*)? Did these adaptations of the book adapt the story, characters and setting effectively? If so, talk about how the aspects of the novel that you felt were distinctive were adapted into the audio/visual format.

A.5

6. Have you used an i-phone app or a digital companion for *Ulysses*, such the Naxos Press companion, or Jo Nugent's *JoyceWays*? Did you think that these digital guides helped to understand the novel, in a way that a normal guidebook could not? What aspects of the digital format did you feel worked, or did not work, in helping to the user to understand the book?

A.6

7. Do you believe a virtual reality format could be a new way to learn about distinctive aspects of *Ulysses*? (If so, please provide more information in A.7 focusing on how you think a virtual reality would be a good, or bad, format to adapt the story, based on your experience of playing games, or your general awareness of games)

A.7
8. How did you feel that the appearance and characterisation of *Ulysses*’ characters and setting in the *I-Ulysses* environment reflects or corresponds to distinctive aspects of the story? (Please provide more information in A.8)

A.8

9. Did you feel the environment’s use of sound effects, voices and songs was an effective aural representation of the book? What significance did the sound effects in the environment have, if any?

A.9

10. In the environment there are a number of external elements that are not part of the city. These include lights, arrows and other elements, which change on interaction. What did you think these elements represent? (Please provide more information in A.10 focusing on what you felt was effective or not about the environment’s presentation of these elements)

A.10

11. After completing certain segments of the environment a bubble appears over the head of certain characters. What did you feel this bubble represented? Did the bubble or other surreal elements disrupt the flow, or realism, of the environment or was it an effective device? (Please provide more information in A.11 focusing on your thoughts about the bubble technique)
12. At points in the environment the perspective switches between different characters in the same scene, with some travelling on trams, and at other points the view changes from a third person perspective in the city to a wider first person perspective. Is this multiple point of view mechanism effective? What do you think it represents? (Please provide more information in A.12)

13. Did you feel there was an order to progress through in the environment? How were things developing in response to your actions? What do you think the ‘order’ of the environment was trying to emulate and did it do so in a manner that was easy or difficult to grasp?

14. Did you think that I-Ulysses environment helped you to understand distinctive aspects of Joyce’s work in a new way? If so how did you feel that these aspects of his work were adapted into a virtual environment format? (In A.14)
Open Question:

Any other comments or advice on the environment?
Appendix C

The final ‘Appendix’ contains a transcript of the Enterprise Ireland feasibility study in its original format:

![Enterprise Ireland Logo]

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Report for Commercialisation Fund Commercial Case Feasibility Project

<table>
<thead>
<tr>
<th>Project Code:</th>
<th>REI1184</th>
</tr>
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<tr>
<td>Project Title:</td>
<td>I-Ulysses: Poetry in Motion</td>
</tr>
<tr>
<td>Report Date:</td>
<td>14/03/2014</td>
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</table>
Report for Commercialisation Fund Commercial Case Feasibility Project

Complete the report below to provide an overview of the findings of the feasibility project and append copies of ALL external consultant/patent attorney reports or other relevant information obtained as part of the project to the report.

Final Payment will be made only when the Project report is received and accepted by Enterprise Ireland. Reports should be submitted by e-mail to Institutes.Contracts@enterprise-ireland.com

<table>
<thead>
<tr>
<th>RESEARCHER:</th>
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<td>E-MAIL:</td>
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<tr>
<td>TTO CASE MANAGER/CDM:</td>
</tr>
<tr>
<td>ENTERPRISE IRELAND COMMERCIALISATION SPECIALIST:</td>
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1. SUMMARY OF FEASIBILITY PROJECT ACTIVITIES (AS DETAILED IN THE PROPOSAL/LETTER OF OFFER):

<table>
<thead>
<tr>
<th>Task No:</th>
<th>Task Description</th>
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</tr>
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<tbody>
<tr>
<td>1</td>
<td>Test Market Feasibility</td>
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</tr>
<tr>
<td>2</td>
<td>Profile Market Landscape and User Testing Scenario</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>Prototype Development</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>Prototype Deployment (Trailer)</td>
<td>Yes</td>
</tr>
</tbody>
</table>
2. **KEY FINDINGS OF THE FEASIBILITY PROJECT (MAXIMUM 2 PAGES)**

Summarise the key findings of the Feasibility study including as relevant:

- the commercial opportunity for the technology/project idea
- the potential for its commercialisation to have an economic impact in Ireland
- the novelty of the technology/project idea and the potential to generate new intellectual property (IP)

- The *I-Ulysses* Concept

- NUI Galway Huston School of film engaged with Enterprise Ireland to conduct this feasibility study in Q.3 2013 to Q.1 2014 and were awarded €15k to allow us utilize the expertise of 3 providers to assist us build this business case for development of this new product concept in the gaming business market. *I-Ulysses* aims to provide a new spatial experience for one of the most famous novels’ in the English language, James Joyce's *Ulysses*, encouraging users to read the novel, download new content for the game and visit Joyce's Dublin.

- An independent study of the Joyce publishing, tourism and social media markets was undertaken by Dr. Luca Crispi of UCD to assess the commercial value of the Joyce industry.

- Mr. Gary Mullin a market analyst from IONconnect was appointed to assess and collate the market value of a Joyce virtual learning game.

- The independent digital media production company *MakinMedia* was appointed to consult on a prototype 5-minute trailer presentation under the direction of Simon Colreavy Donnelly. This was with the aim of providing an example of the finished games appearance and asset hierarchy, to be given in a presentation format.

- *Ulysses* publishing is a multi-million dollar industry, growing since the lifting of the copyright in 2012. A first edition of the book recently was auctioned for 350,000 dollars in New York. The consumer and educational book market is worth 100,000,000,000 dollars globally annually.\(^44\)

- The *I-Ulysses* brand will leverage the commercial potential of Joyce’s work from the perspective of its narrative, architecture, music and tourism by presenting content from the novel in an online game environment.

- Upon successful completion of this feasibility study the team feel the results shown below will portray why we would like to

progress this project into a commercialization fund application to develop the product to a point where it can be brought to market.

- The *I-Ulysses* spinout would be the flagship of a series of games based on urban novels; Dickens’ London or Hugo’s Paris for example.

### Target Markets for *I-Ulysses*

<table>
<thead>
<tr>
<th>Target</th>
<th>Size</th>
<th>Justification</th>
<th>Evaluation/Platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>The <em>I-Ulysses</em> brand can appeal to students between the ages of 16-25. Aimed at demographics that play <em>World of Warcraft</em>, <em>The Sims Online</em>.</td>
<td>Literature courses globally would value an interactive learning resource such as this to be taught in schools</td>
<td>Potential to develop the game into an interactive guide for other novels on curriculum also.</td>
<td>Best platform for support of <em>I-Ulysses</em> brand would be PC, Android, iPhone with freemium model of distribution with DLC.</td>
</tr>
<tr>
<td>Vast potential exists also for readers familiar with the book from college, 30+.</td>
<td><em>Ulysses</em> has a strong online fan base, in <em>Twitter, Facebook and Academia.edu</em></td>
<td>New markets for the <em>Ulysses</em> brand, as <em>I-Ulysses</em> is also aimed at gamers (16-35 age group).</td>
<td>Online game with a value of roughly 20 euros a month (roughly equals value of competitor DLC with an annual intake of 300,000,000*)</td>
</tr>
<tr>
<td>Experts on <em>Ulysses</em> can use the guide to help them teach the novel.</td>
<td>High degree of specialization exists in higher levels at university, where Joyce is universally taught.</td>
<td>Academics use electronic literature and professional learning guides, such as this, extensively.</td>
<td>With basic membership brand would still disseminate through tutors and word of mouth, supporting the model</td>
</tr>
</tbody>
</table>

- **The commercial opportunity for the technology/project idea**

  - In his report Dr. Crispi assessed the market potential of academic and casual Joyce readership in Ireland and abroad since the lifting of the copyright on *Ulysses* in 2012.

  - Dr. Crispi provides figures from the *James Joyce Centre*, the foremost organizer of Joyce based events and walking tours in Ireland, representing the increase in income made by the Centre between 2011 and 2012 (See Fig 1).
He also provides figures from the Irish publishers O’Brien and Alma Press on numbers of books sold and downloads of apps from the RTE Players and Librivox audiobooks of Ulysses since 2012 (See Fig 2. and 3.).

(Fig 2. In the above chart the annotated Alma Classic edition’s sales and the O’Brien Press’ are represented as a pie-chart)
- (Fig 3. In the above chart the pay to download Librivox and RTE Player versions of Ulysses Audiobooks are represented)

- Mr. Mullin looked at the ‘live’ games model that the I-Ulysses brand is based on, free-to-play games, server based gaming and online subscription-based platforms were also examined.

- The Potential for its Commercialization to have an Economic Impact in Ireland

- There are approximately 100 game companies currently operating in Ireland, employing nearly 3,000 people.

- The games industry here is worth at least 250 million as of 2013 based on retail figures.\(^{45}\)

- In the last few years the net value of the micro-transaction ‘live’ gaming markets have contributed more significantly (>30%) than retail to the relative success of the games industry in the recent times.

- The I-Ulysses brand is structured to exploit the ‘live’ games market.

- The ‘live’ environment that would support the game would have a strong parallel online community presence in Facebook and Twitter (See Fig.4 and 5)

---

\(^{45}\) Taken from Jamie McCormick’s survey on the games industry in 2013.
Fig 4. – Ulysses Community on Twitter

(Fig 4.) shows eleven examples of pages and people that discuss James Joyce and *Ulysses*. The examples above are a highlighted fraction of the user base on *Twitter*. Although some users have more followers than others, it is observed that combined, all of the users on *Twitter* demonstrating an interest in *Ulysses* would provide a large base of potential *I-Ulysses* users).
Irish games’ companies like *Noho*, who specialize in urban rendering, *Havok*, who work in the area of game physics and the Galway-based *RealSIM* have been considered as potential Irish candidates to produce the game.

There would be collaborative potential with the *Windmill Lane Initiative*.

**The Novelty of the Technology/Project Idea and the Potential to Generate New Intellectual Property (IP)**

The project aims to address the current lack of urban literary games, or games based on particular literary environments; the *I-Ulysses* brand would pioneer this.

Mr. Mullin explored the best commercial model for distribution and deployment of the *I-Ulysses* project, to show how the deployment model of the *I-Ulysses* brand has a unique commercial matrix (See Fig 6.).
### Strength Weakness Opportunities Analysis for I-Ulysses

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognizable brand in James Joyce and Ulysses.</td>
<td>No guarantee that users will purchase DLC from the game.</td>
<td>Potential for more game releases from chapters of the novel.</td>
<td>Other online games perceived as more fun to play may take some of the market.</td>
</tr>
<tr>
<td>Popularity of <em>Ulysses</em> as a discussion topic means it has a large community of engaged fans.</td>
<td>No image as a brand for gaming which may hinder its commerciality.</td>
<td>Potential to develop from a game to a movie.</td>
<td>Existing perception as ‘impossible’ to read may negatively impact user numbers.</td>
</tr>
<tr>
<td>Vast potential for DLC due to the size and depth of the novel.</td>
<td></td>
<td>Niche market meaning the potential for a highly interactive and engaged user base.</td>
<td>Very niche market meaning a potential low population of users.</td>
</tr>
<tr>
<td>Dedicated team to provide game updates and new DLC every three months.</td>
<td></td>
<td>Potential to be used as an educational aid for enhancing the learning experience.</td>
<td>Without investment and funding, it will be difficult to create a high quality game.</td>
</tr>
<tr>
<td>Superior product to other serious learning games through customer service, graphics and usability.</td>
<td></td>
<td>Penetration of new markets for the <em>Ulysses</em> brand.</td>
<td></td>
</tr>
<tr>
<td>Strong culture and fan advocacy of <em>Ulysses</em></td>
<td></td>
<td>Potential for linking with the Joyce Centre in Dublin and third level institutions for strategic partnerships.</td>
<td></td>
</tr>
</tbody>
</table>

- This *I-Ulysses* model would form a fully integrated online-asset based gaming marketplace, which would yield new IP in the areas of: 1) Developing a unique virtual learning environment for literature. 2) ‘Special knowledge’ of Unity (see below) 3) Games development media generally and potential new licenses.

- As Dr. Crispi contends there is an enormous commercial opportunity within the Joyce industry for the *I-Ulysses* concept, given that copyright is up and general interest in the book has increased.

- Even in this feasibility stage, he argues, it is clear that, “its greatest asset is its ability to visualize the spatial and
psychological dynamics that are inherent in James Joyce’s text.”

- As part of his report Dr. Crispi submitted a focus group sample (see below) that indicated a high level of interest in the game prototype, even at this early stage.

- Mr. Mullin’s report provided an introduction to the feasibility of developing a learning environment in the form of an online game around *Ulysses*. From the research carried out, it was observed that a strong online community exists around James Joyce and *Ulysses* on *Twitter*, *Facebook* and *Academia.edu* (See Fig. 4 and 5 above)

### I-Ulysses Prototype

- The independent digital media production company *MakinMedia* was appointed to consult on a spec prototype 5-minute trailer presentation under the direction of Simon Colreavy Donnelly. This was based on a pre-existing Joyce game prototype built with *Unity* that was shared with *MakinMedia* under NDA (link included in e-mail).

- The footage of the game was rendered to show multi-layered play experiences, not just at the level of immersion in the game environment but from the point of asset workflow management. In *Unity* the functionality provided by ‘prefabs’ and *Load.levelAdditiveAsynchronous* function allows a designer to play with the order that game ‘events’ occur, so they can be made backwards or cross-compatible. Such an environment run in an online setting would be updateable in a ‘live’ state, so the ‘play’ state of the game is the same as it is being updated online.

- This technique would marry the commercial and technical models underpinning server-based games with more traditional online games, using memory saving techniques. This would represent a development of enormous commercial and IP potential to the games industry. As everything runs through the one CPU core or terminal, this current instance, or ‘state’ of the game, this limits the overhead associated with multi-threading, which is how this technical effect would be achieved in a comparable commercial online game like *World of Warcraft*.

- In terms of the game itself this would be like starting with a labyrinth which the designer could then regularly add new corridors to, based on the *Ulysses* content. The designer would explore what different characters were doing at different times by releasing new modifications every month at a value of 20 euros p/t (following the example of competitor modifications).

### Commercialization

- Based on the results of the reports, the funding gained from the EI commercialization grant would be used to fund the
development work on this new business idea, generating a new NUI Galway spin out, which would be the flagship of a series of games based on urban literature in an online environment.

- All the companies and resources deployed in the production, marketing and designing of the I-Ulysses flagship would then be leveraged towards the building and maintenance of this spinout.

• Responses from Market Experts and General Public

The following industry experts were asked what their opinion was of the I-Ulysses brand based on their immediate response to the game prototype. Each of these sources is an expert in their respective field. Daniel Ferrer is an expert in the field of Joyce Studies and Hypermedia. Sam Slote is an expert in the field of Joyce Studies and is a lecturer at TCD on English literature, Modernism and James Joyce. The Inagh Valley Trust is a venture capitalist that works on setting up startups in Ireland of prospective value to the Irish economy, focusing on areas in the Sciences, Arts, Food and Agriculture. Declan Clarke is a Director of the Trust and has worked with several startups in Ireland, one of which is also based in NUIG. Ronnie Robbins is also a Director of the Trust and one of its co-founders. Both are experts in the areas of business marketing for startup projects such as I-Ulysses.

“A very interesting phenomenon”
- Daniel Ferrer, Joyce Hypermedia expert

“Ulysses really does need some kind of ‘Digital Humanities’ visualization -- and it's surprising that it hasn't happened yet.”
- Sam Slote is a Joycean Expert based in TCD. He has published several novels on Finnegans Wake and teaches courses on Ulysses at TCD.
"The *I-Ulysses* project represents a major opportunity to blend the academic integrity of Joycean study with established gaming platforms enjoyed by millions across the globe. I believe with the right Commercialization team this could result in a commercial prospect of net value."

"As a Director of the *Inagh Valley Trust* I help establish startup companies with significant export potential. A core role I enjoy is taking a concept through to commercialisation, which includes working with the company to evince strategies to attract investors and develop vibrant product pipelines. Companies include *Advance Science Ltd, The Coral Farm, JLP Analysis, In Vivo* and *The Connemara Food Company*. Our mission at the Trust is to ‘To enhance society through enterprise, research and creative thinking’ with a goal of ‘identifying societal issues where the energy of enterprise and insights of research can have positive lasting impacts.’"

- Declan Clarke, CEO *Inagh Valley R&D Enterprise Ltd.*

"At *Inagh* we target three core stands of enterprise development, namely, Science and the Environment, Predictive Medicine and the Creative Arts. The *I-Ulysses* project has potential to be a significant player in our Creative Arts strand and as such is a project we welcome to the cluster. In essence we envisage an equity stake holding to realize the commercial potential and internationalization of the project through investment vehicles, extension to the *Inagh* network and assigning a competent mentor to the project."

- Ronnie Robins, Trustee and Co-Founder, *Inagh Valley Trust*
Focus Group Study

This focus group was conducted on Wednesday 5th March 2013. The sample for the focus group was taken from the *Ulysses* and *Finnegans Wake* reading groups which meet every Wednesday at 6.00 pm at the *James Joyce Centre* on North George’s Street. We had the permission of Mark Traynor, one of the Directors of the Centre to conduct the focus group. The sample consisted of volunteers drawn from both reading groups, who before the reading groups proper took 10-15 minutes of their time to take part in the survey. They were shown a short demonstration of the game prototype and were then requested to fill out a short questionnaire based on what they had seen. The questions were sixteen in total and the attendees would rank the answers in terms of whether or not they agreed with the statement in the question, disagreed or strongly agreed/disagreed. In some of the questions answers such as ‘never’ or ‘occasionally’ are equated with strongly agree/disagree, as are the positive and negative responses. The individual questions are reproduced below.

### Questions

1. Are you familiar with *Ulysses*?
2. Do you believe that the reputation *Ulysses* has as a difficult book puts readers off?
3. Do you believe that reading *Ulysses* in groups (either in classrooms or elsewhere) can help readers better understand the book?
4. Now that the copyright restrictions have been lifted on *Ulysses*, do you believe that artistic interpretations of the book (such as dramatizations, performances, readings, musical versions, graphic novels, paintings, etc.) can be a worthwhile contribution to an understanding of the book?
5. Do you play video games often?
6. Would you agree with the statement that video games based on difficult books about cities can attract new readers to those books?
7. Would you agree with the statement that a video game based on *Ulysses* can attract new readers to the book?
8. Would you agree with the statement that readers already familiar with *Ulysses* will find playing a video game based on the book engaging?
9. Do you believe playing a video game version of *Ulysses* can be a worthwhile companion to reading the novel?
10. Do you believe playing a video game version of *Ulysses* can be a
worthwhile environment in which to learn about the novel?
11. Do you believe playing a video game version of *Ulysses* can be an entertaining way to find out more about the novel?
12. Do you have a good sense in your imagination of how the characters in the book might look and speak?
13. Do you have a good sense in your imagination of how Dublin and other locations are represented in the book?
14. Do you believe that a visualization (as in a video game) of the characters and the places in the book is a worthwhile contribution to an understanding of the book?
15. Do you believe that a video game that represents the thoughts and actions of characters as well as the three-dimensional aspects of the locations of the scenes is a worthwhile contribution to an understanding of the book?
16. Besides having a guide to the content of the novel, would you enjoy being able to shape aspects of the game’s design and play, thereby transforming the experience of reading the novel?

**Percentage Results for Each Question**

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<thead>
<tr>
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<th>Agree</th>
<th>Disagree</th>
<th>Don’t Know</th>
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**Questions (1-16)**

- Interpretation of Results

It is clear from this graph taken from a Joyce reading group that, although many were unfamiliar with video Games in general, the concept of a Joyce video game would be an entertaining experience for Joyceans and newcomers alike. The majority of the group felt that based on the version of the Joyce game they were shown, a Joyce
game would attract new readers to the book, would be engaging, represented the
events, characters and locations of the book well and that it would be a worthwhile
companion to reading the novel. The gender and age breakdown of the participants
involved in this study consisted of 60% females between 40 and 60, 10% females
below 40, 20% males below 30 and 10% males between 40 and 60. Most of the
participants were studying the novel in their spare time, though some were also
students at UCD who were involved in the reading group, through the English M.A.
courses being taught in that university. The focus group numbered 12 participants in
total.

3. CONSULTANT/EXPERT REPORTS

<table>
<thead>
<tr>
<th>Name: Dr. Luca Crispi</th>
<th>Email: <a href="mailto:luca.crispi@ucd.ie">luca.crispi@ucd.ie</a></th>
<th>Have you included their report in the appendix?</th>
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<tbody>
<tr>
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<tr>
<th>Name: Mr. Gary Mullin</th>
<th>Email: <a href="mailto:gary@ionconnect.ie">gary@ionconnect.ie</a></th>
<th>Have you included their report in the appendix?</th>
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<table>
<thead>
<tr>
<th>Name: Mr. Geoff Allen</th>
<th>Email: <a href="mailto:geoff@makinmediamobile.com">geoff@makinmediamobile.com</a></th>
<th>Have you included their report in the appendix?</th>
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<td></td>
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Are you planning to submit a follow-on Standard Application to the Commercialisation Fund Programme?

<table>
<thead>
<tr>
<th>Have you included their report in the appendix?</th>
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<tbody>
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<td>Yes</td>
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APPENDIX: PLEASE INSERT EXTERNAL CONSULTANTS/EXPERTS REPORTS HERE…….
Summary
The brands ‘James Joyce’ and ‘Ulysses’ are some of the most recognizable in the global and Irish cultural marketplaces. Although it is difficult to put a monetary figure on its value, the writer’s work is clearly the most highly commercialized modernist literary text in the English language around the world. Since the sensational appearance of the first edition in 1922, the book has been acclaimed as one of the greatest masterpieces of modern literature at the same time as it has been surrounded by controversy. Banned in the US until 1934, accused of being pornographic or worse, it is now a central work in the Western literary canon. It is the Modernist text par excellence and it’s literary, cultural, and commercial value has continued to steadily increase year by year and there is no sign of the interest abating. With the lifting of the copyright restrictions on the work in 2012 and the growing interest in print and digital companions for academic and general audience markets, the commercial potential for products associated with James Joyce’s Ulysses appears to be limitless. Based on my research, there is no commercially available product like I-Ulysses on the market. It targets a potentially lucrative niche that stands between academic-oriented electronic media and commercially-oriented adaptive resources. If properly conceived and executed it is certain to find a worthwhile place in the ever-growing Irish Joyce marketplace.

Academic and Cultural Tourism
Once thought unfit for critical attention, Ulysses is now on the course curriculum in third-level institutions around the world and has a mass appeal with general readers, even though it is often the case that these readers do not finish reading the book without support. I teach two Joyce undergraduate courses per semester at UCD and they are always full to capacity with both Irish and international students. With the establishment of the UCD James Joyce Research Centre, the university recognized the national and international significance of its most famous alumnus.
Ulysses is one of the greatest works of modern city literature and has spurred a surge in cultural tourism to Dublin and to Ireland. The Bloomsday celebrations which began in 1954 reached their climax in 2004, when an estimated 100,000 visitors enjoyed some form of the festivities associated with the Dublin ReJoyce festival that marked the centenary of the day on which Ulysses takes place: Bloomsday, 16 June 1904. Managed by the James Joyce Centre in Dublin (http://jamesjoyce.ie/), incorporating both professional and amateur initiatives, Bloomsday is a thriving literary cultural festival that rivals most any other in the country or the world. For those who cannot make the annual pilgrimage to Dublin to mark the celebration, Bloomsday celebrations have been organized by many other cities in Asia, Australia, around Europe and North and South America. The figures from the James Joyce Centre are illuminating. According to the Centre, in 2012 when Joyce's work entered the public domain:

- Increased income by 21% from 2011: from €261,953 to €317,533. This was partially the result of an increase in funding from additional sources e.g. €20,095 generated in donations towards projects celebrating the work entering the public domain.

- Income generated from additional functions and events doubled against 2011.

- Income generated through bookshop sales increased 36%.

- Total visitor numbers for 2012 shot up to 17,191 (against 15,174 in 2011). This figure broke the record for visitor numbers since the Centre reopened in 2006.

(It is clear to see from the above graph that interest in adaptations and events concerning Ulysses have increased significantly from 2011 to 2012)

- **Reading Groups and Summer Schools**

Still thought by many to be unreadable, it is the focus of literally thousands of reading groups around the world. Following the example of other institutions and
community groups in the US, for example the Rosenbach Museum in Philadelphia (http://www.rosenbach.org/reading-groups) and the Buffalo Ulysses Reading Circle, the James Joyce Centre inaugurated a Reading Group last year and it is continuing its success in 2014. This communal aspect of readers coming together to work their way through Ulysses is clearly a central aspect of the appeal of a community-based gaming resource like ‘I-Ulysses’. Similarly, the Dublin James Joyce Summer School is also a pivotal aspect of the academic and cultural tourist attraction of Joyce in Dublin (http://joycesummerschool.ie/) and there is also a well-established Joyce Summer School in Trieste (http://www2.units.it/triestejoyce/index.html).

- **Print and E-books**

In 2002, when all of Joyce’s works were still under the copyright control of the James Joyce Estate and before the massive worldwide publicity that was generated by the Ulysses centenary and the ReJoyce celebrations in Dublin, it was estimated that about 10,000 copies of Ulysses were sold every year for the past decade. With the expiration of the Joyce Estate’s copyright monopoly on 1 January 2012, there has been a significant proliferation of available print and electronic editions of Ulysses. Given the number of publishers involved and the reticence of almost all of the major publishers to reveal financial information of this kind, it is not possible to have an accurate gauge of the number of books sold or of the global market value of the title. I surmise that due to the increased international interest in Joyce and the growing fame and notoriety of the title, the number of copies sold has presumably more than doubled in the past decade. The publishers who have Ulysses on their lists range from first-tier commercial and academic presses (such as Oxford UP, Penguin, Bodley Head, Random House and Vintage) to a wide array of other publishers (like Wordsworth Classics, O’Brien Press, Alma Classics, as well as a wide range of even smaller, often simply for-profit publishers).

Through personal contacts I have been able to find out the sales figures of two of the new Ulysses editions. The O’Brien Press, an Irish publisher, who launched their edition to coincide with the first Bloomsday celebration under the new copyright
regime, state that ‘we have sold approximately 1000 copies of our editions – just over 900 paperbacks and just under 300 hardbacks. Expectations for next year: impossible to say. It’s not a large-volume mass-market title for us (unfortunately!) so a few hundred each of Hardback and Paperback is most likely’. It was the text used by readers around the world in a collective reading of the work as part of Global Bloomsday (http://globalbloomsday.com/).

Similarly, the UK-based Alma Classics edition with annotations that appeared in 2012 report that they have had a ‘total sales 2129 copies - 484 copies left in stock’ [of their hardback, priced at £14.99] and ‘total sales 1580 copies - 481 copies left in stock’ [of their paperback edition]. Ulysses has also been translated into over thirty languages and, though it is impossible in the context of this study to determine accurate figures, presumably the combined sales of the book would rival the number of English-language copies sold annually.

There has also been a marked growth in digital editions of various texts and commentaries available for Kindle devices, for example. At least three complete audio versions of the book are also available. One by Jim Norton and Marcella Riordan (Naxos) and the other by RTÉ Players, which has recently also been made available for free on the Internet Archive (https://archive.org/details/Ulysses-Audiobook) and has been downloaded over 47,000 times, when I last checked. Furthermore, Librivox has also issued a recording of Ulysses, which was read by Librivox volunteers, and it was downloaded almost 335,000 times, when I last checked. Many electronic versions of the book are also available online, the most significant of which was produced by Project Gutenberg and can be found on their
website. There are many free (or almost free) digital apps on Google Play for *Ulysses*, including those by Hongshee Software, Thanakorn Papan, han hong li, MyApp Builder, etc. Prof Joe Nugent of Boston College and his students have developed a walking tour app in cooperation with the James Joyce Centre called ‘JoyceWays’ ([http://joyceways.com/](http://joyceways.com/)) and is currently working on ‘Digital Dubliners; The Boston College Critical Guides’ app ([http://digitaldubliners.com/](http://digitaldubliners.com/)), which is ‘written by students for students’. Similarly, in this centenary year of the publication of *Dubliners*, the UCD Humanities Institute has launched a free iPad app on ‘The Dead’ that is available on *iTunes*.

- **Online**

There is also a thriving online discussion-based community that is devoted to study and enjoyment of *Ulysses*. For example: *Ulysses* for experts: [Ulysses_for_experts-owner@yahoogroups.com](mailto:Ulysses_for_experts-owner@yahoogroups.com), J-Joyce list: [j-joyce@lists.utah.edu](mailto:j-joyce@lists.utah.edu), *James Joyce Quarterly* blog: [http://jjqblog.wordpress.com/](http://jjqblog.wordpress.com/). As well as, academic online resources, such as: *James Joyce Online Notes*: [http://www.jjon.org/](http://www.jjon.org/) and *Genetic Joyce Studies*: [http://www.geneticjoycestudies.org/](http://www.geneticjoycestudies.org/). Many other professional and personal websites are devoted to Joyce and his works, the oldest of which is Jorn Barger’s seminal blog at *Robot Wisdom*. *The Brazen Head* is also a well-established resource: [http://www.themodernword.com/joyce/index.html](http://www.themodernword.com/joyce/index.html). Furthermore, ‘James Joyce’ has over 1,000 followers on *Academia.edu*, from general reader aficionados and students to university professors and everyone in between.

- **Dramatic Interpretations**

In the 1930s, Warner Bros in the US commissioned the American avant-garde poet
Louis Zukofsky to write a screenplay for *Ulysses*, though nothing ultimately came of this endeavour. While of significant artistic merit, commercial and legal considerations scuttled the project. The two attempts to film *Ulysses* (by Joseph Strick in 1967 and Sean Walsh in 2003) have had varying degrees of critical and commercial success and we await a more sustained adaption in the future. As far as I know, there have been no television adaptions of the work, but who knows what may be planned or what may be done in years to come. In my experience, the best way to gauge the impact of Joyce and *Ulysses* in the media may not be in the way in which it has been produced as a work, but rather the fact that the writer and the work have permeated the cultural consciousness to the point where references to Joyce and *Ulysses* regularly appear in songs, television shows, and films. It would be impossible to overestimate the pervasive currency of these references in the widest range of media that appeals to a very broad range of age and interest groups. Since the lifting of the copyright embargo in 2012, numerous literary, dramatic and musical interpretations of Joyce’s works have been presented. There are too many
examples to list here, but the most notable have been the critically acclaimed Frank McGuinness’s adaptation of ‘The Dead’ which had its international premiere at the Abbey Theatre in December 2012 and Olwen Fouéré’s ‘riverrun’, a one-woman performance of a chapter from Finnegans Wake, which premiered at the Galway Arts Festival in July 2013 and played full houses in both Kilkenny and Dublin for the rest of the year. Similar smaller productions of Dubliners have been showcased around Ireland as well as in New York City. There has been much talk about Ulysses productions (both of the entire book and of individual episodes) by both amateur and professional companies, but as of yet they have not appeared. Undoubtedly, bigger and better productions will be mounted in the coming years.

- **Cultural Tourism**

There are many well-established cultural institutions both generally and specifically related to the life and works of James Joyce, James Joyce Centre, Joyce Tower, Usher Island House, Sweny’s, the National Library of Ireland, Newman House. The cultural and commercial value of James Joyce’s name and works is most evident in the Irish governments over £15 million investment in Joyce’s manuscripts just from 2000 to 2006. The manuscripts were initially used to leverage the opening of a new exhibition hall in the National Library of Ireland in June 2004. I was co-curator of its ‘James Joyce and Ulysses at the National Library of Ireland’ as its inaugural exhibition. It was the premier academic-cultural event of the ReJoyce celebrations that year. UCD has further recognized the importance of Joyce as a cultural magnet with their initiative to setup a multi-million Euro Joyce-related museum on St Stephen Green (http://www.irishtimes.com/culture/books/new-joyce-centre-destined-for-st-stephen-s-green-1.1597742).
Analysis of I-Ulysses Game

As I have discussed above, there is no product available on the market that is comparable to what is being undertaken with I-Ulysses. Even in its developmental stage, it is clear that its greatest asset is its ability to visualize the spatial and psychological dynamics that are inherent in James Joyce’s text. These are two of the most challenging and rewarding aspects of the experience of reading the book and are often the most difficult to comprehend by first time readers and, of course, by the vast majority of readers who are unfamiliar with the specific geographic, topographic, architectural, and scenic aspects of Dublin, let alone of Dublin 1904, or the creatively imagined 1904 Dublin of Ulysses.

Much like the book, it recreates a multi-linear, multi-layered, cross-sectional experience of the city and its citizens. The technology allows I-Ulysses to represent the variously radical stylistic innovations Joyce introduced in a visual three-dimensional format, something that no other approach to the book allows. The more traditional approaches are the act of reading (individually or in groups, in Dublin or anywhere else) and the reliance on print and/or digital guides and companions, no matter how replete with contextual historical or critical information they may be. The experience of reading Ulysses has often been linked to the experience of today’s digital hypertext avant la lettre; and while there have been some efforts to incorporate hypertextual elements as part of various commentaries, they have ultimately all been quite rudimentary and limited. I-Ulysses will incorporate the traditional assets of a hypertext companion—that is, content and context in the form of annotations, music, images, topographical, architectural, and geographical
information—but deploy them to deliver a dynamic user immersion in the work and its world.

Besides providing a guide to the content of the novel, *I-Ulysses* lets the user shape aspects of the game’s design and play, in a sense mimicking the active role of the author and the narrational ‘Arranger’. This is the name that Joyceans have given to textual presence that shapes the presentation of the action and thoughts of the characters in the book. *I-Ulysses* will mirror the multiple perspectives on the same scene that is an essential aspect of the radical experience of reading the book in a graphical immersive and participatory manner. By doing so, it will draw both novice and those more familiar with the novel in as active players in the generation of meaning and plot and involve them in a communal, online experience that goes far beyond the traditional reading group that is a fixture many people’s experience of *Ulysses*. The game encourages the active participation of the players to better understand the more serious aspects of the novel and engage with its more playful stylistic and thematic aspects, unlocking the inherent potential in the book to be an ever-expanding world of words.

Using computer graphics and game technology, it is able to give user/player an immediate fully-spatialized sense of the city. Beginning in the iconic *Martello Tower* in Sandycove on Dublin bay, it will follow Stephen Dedalus as he makes his way to Dalkey, then to walk ‘into eternity’ on *Sandymount Strand*, and the rest of his course on 16 June 1904. It will then follow the corresponding trajectory of Leopold Bloom as he makes his way from *7 Eccles Street* on the northside of the Liffey though his odyssey from one end of the city to another, from *Westmoreland Street* to *Glasnevin*...
cemetery, over to Ormond Quay and back again to Sandymount. Finally, the two characters will first meet in Holles Street hospital and meet again in the Monto district late at night. The book and the game will follow the two newly united friends back home to Eccles Street, only to separate again and go their own way in the night. There is much to ground to cover and explore in I-Ulysses as players to see how Joyce and so the creators of the game have visualized the various contours of the city.

The demo shows the Martello Tower from a perspective that visitors to the Joyce Museum in Sandycove would or could know and also imagines the way Joyce’s characters and readers might see it as they make their way through the novel. While its current iteration showcases how it can visualize the multi-spatial and multi-temporal coordinates of the first episode of Ulysses, Telemachus, it will fully realise its potential when it explores the tenth episode of the book. At the centre of the book—and so the game—Joyce has created a masterful homage to the city and its citizens in ‘Wandering Rocks’ (the tenth episode of the book). This episode is made up of 19 sections each with its own sets of characters, but Joyce also explored the possibility of a multiplicity of representations of the same scene, the same street corner, and the same people from a variety of temporal and spatial orientations.

This is the ideal material to showcase the strengths and unique contribution of I-Ulysses. In ‘Wandering Rocks’ Joyce took the possibilities of representing the multiple, though unique individual experiences of a wide variety of people (virtually the entire cast of characters in Ulysses) walking through Dublin and variously intersecting with one another in person and imaginatively. This is a tour de force in
the history of literature is an exciting opportunity for the application of digital game technology to the content and style of this hallmark episode of the book and of Modernism more generally. The game will visualize the multiple overviews of the same places and events that are embedded in the book, but will also allow the possibility of exploring other perspectives on those places and events that are inherent but not actualized in Joyce’s narrative. Only *I-Ulysses* offers this kind of experience. While this would be interesting as a digital installation generally, the communal participatory game aspect offered by *I-Ulysses* is unique and its greatest strength as a companion to this book and to other city-centred novels more generally. The game would be run on *iPad, IOS* and *Android* platforms using the features of the *Unity* engine, development would last initially six months and a small team of individuals would be employed with the task of continually updating the game. *Noho* (http://www.noho.ie/) is one candidate for the building of the Dublin city of the game, but other games companies in Ireland such as *RealSIM* (http://www.realsim.ie/home) and/or *Havok* (http://www.havok.com/) could be employed for game production.

- **Guides**

Since the 1960s, there have been groups of readers following in the footsteps of Leopold Bloom and Stephen Dedalus and the many other characters that walk through the Dublin of Joyce’s book. The physical landscape of Dublin is a long-standing and seemingly perennial subject of interest to readers of *Ulysses*. There is a long tradition of publishers producing text-and-image-based guidebooks with maps to help readers begin to understand both the realism and the gaps between the real Dublin of 16 June 1904 and the creative licence that Joyce takes with the urban facts
of the city in the recreation of the city in his work. An excellent recent contribution to this is Ian Gunn and Clive Hart’s James Joyce’s Dublin: A Topographical Guide to the Dublin of ‘Ulysses’ (Thames and Hudson, 2004), which was published to coincide with the centenary celebrations of ReJoyce in Dublin that year. With its essays, maps, directory and notes, it is a seminal work on the subject. But its strength is also its limitation, as print book, even with its beautiful and helpful maps, drawings, photos, charts and architectural models, it is still a two-dimensional rendering of the three dimensional real and fictional world of Dublin and Joyce’s Dublin of 1904.

There are also several variously well-done tour-guides to accompany the novel, such as Robert Nicholson’s The ‘Ulysses’ Guide: Tours Through Joyce’s Joyce’s Dublin (New Island, 1988, 2002) and Joyce’s Dublin: A Walking Guide to ‘Ulysses’ by Jack McCarthy (Wolfhound Press, 1986). These books (and many more like them) attest to the immense interest in the real and fictionalized Dublin in Ulysses. There are also countless books of photographs of the Dublin of Joyce’s era. Furthermore, the National Library of Ireland commemorated the vital importance of historical images as a companion to a reading of Joyce’s works with a seminal exhibition, Joyce Dubliners that was based on its unparalleled archive of early twentieth-century images in its Laurence Collection. None of these resources is able to provide the three-dimensional rendering of the Dublin in Ulysses in anyway analogous to I-Ulysses.
• Exhibitions

When I worked on the ‘James Joyce and Ulysses at the National Library of Ireland’ exhibition in 2004, I was clearly aware that visitors would want to ‘experience’ Joyce’s Dublin in a virtual way as an analogue to their readerly textual experience of the city in the book. While not attempting anything on the scale or ambition of I-Ulysses, the physical space of the exhibition was constructed in such a way as to convey the structure of the novel and the experience of reading it. For example, in a way that is analogous to the book, we created discreet but interrelated installations that could be ‘read’ much like we read Ulysses as discreet individual episodes that are also intrinsically linked to the themes and goals of other episodes. We could gauge the success of the experience when visitors fully involved in one installation would be drawn across to another and then use similar tools and insights to work through the various installations. Using line of sight was essential, while enjoying the challenges of interpreting one section visitors could see that there were analogous ‘games’ to be played in other installations situated strategically around the room. We also used maps and digital technology to enhance the spatial and experiential aspects of the book and the exhibition.

For example, the National Library commissioned David Lilburn, a cartographer to conflate maps of 2004 and 1904 Dublin with his own life-long interest in the city and the book to create an imaginative and artistically engaging interpretation of his own. The analogy of this work with I-Ulysses is clear: both take the content and parameters of the work and recreate the city in fact and fiction at the same time as it creates an interpretative world of its own. Much like the visitors to the exhibition, players of the game will be challenged to see the correspondences with Joyce’s
fictionalized Dublin as well as the creative licence that the creators of *I-Ulysses* have imbedded in their world. The WB Yeats Exhibition took many of these principles and enriched and extended them for similar effect. For example, we tried to recreate ‘Yeats’s World’ in an interactive that charted the poet’s travels across Ireland, Europe and the US. More fundamentally, we designed the physical and digital versions of the exhibition in tandem so that visitors could experience the exhibition online either before or after their visit to the physical site on Kildare Street. Incorporating readily available technology, I believe this was the first time this had been achieved in a museum setting.

- **Imaginative Explorations of *Ulysses***

Readers and critics have been as interested in the imaginative world of the characters Joyce has created in *Ulysses* as they have been in actual and fictional city that is represented in the book. I can only think of one book that has successfully sought to meld the two interrelated spheres of the book: Michael Seidel’s *Epic Geography: James Joyce’s Ulysses* (Princeton Univ. Press, 1986). It ‘maps’ Homeric correspondences on Dublin and interrogates the impact this has on its main characters. While it is difficult for a scholarly work to investigate these issues, they seem tailor-made for their exploration in the game format offered by *I-Ulysses*. 
Marketing Strategy

I-Ulysses: Poetry in Motion

By Gary Mullin
ION Connect Ltd
N17 Business Park, Milltown, Co. Galway
Executive Summary

Whilst games for computers have been around for many years, the recent successes of games such as *World of Warcraft* has developed an interest within the academic sector to develop learning tools to better engage learners. Due to the combination of games, social networking and internet accessibility, these virtual worlds will be able to flourish within academia. *Ulysses* by James Joyce has a significant place in the history of literature but in its modernist technique it has often been criticized by many as being unreadable. The novel records events over the course of one day in Dublin concerning its two central characters of Leopold Bloom and Stephen Dedalus.

*Ulysses*, more than any other novel, was created for the digital world. Many projects have existed to create digital versions with images, annotations and commentary to make it more entertaining. Creating a virtual learning environment for *Ulysses* which delivers the best quality in graphics and accuracy would open the door wide for a ready-made audience to immerse themselves deeper than ever before into the feast of words the James Joyce has created in Ulysses.

Serious games are designed with the goal of enhancing the learning process, be it a particular topic or full curriculum. In the medical sector and as driving instructor aids, these games have existed for years due to their ability to break down the barriers between theory and practical. The benefit of using these games within all areas of education is now well known. A dynamic shift in the delivery of academic content delivery at all levels of education from a theoretical approach to an approach which combines theory, visual and practical techniques for a more encompassing learning experience.
Introduction

_Ulysses_ since its creation has caused much debate among scholars, fellow authors and the general public. From its labelling as an unreadable and blasphemous piece to Judge John M. Woosley blocking its introduction to the United States, _Ulysses_ has invoked a passionate response from those that read it.

The following report will seek to identify and discuss the feasibility of developing a Virtual Learning Environment (VLE) in the form of an online game. Areas which will be highlighted include the virtual learning market (VLM) in relation to assessing the potential commercial appeal of the _Ulysses_ based gaming environment. The online community in relation to gaming and _Ulysses_ will be assessed through a dissection of social media channels and online marketing tools including but not limited to Facebook, Twitter, YouTube and MailChimp.

This research discusses the proposed implementation of a marketing plan for _I-Ulysses: Poetry in Motion_ which can be run from its potential highlighted base within The Inagh Valley Trust. The research also discusses and explains why having a social media presence is relevant for a gamer and how to effectively engage with a social audience to build and maintain a successful online brand.

The following report will investigate the following areas

**Introduction to a Framework for E-Learning:**
- Assessment of the Virtual Learning Market
- Assess the online gaming sector and market value of learning themed games
- Evaluate the DLC models available to _I-Ulysses_
- Provide an assessment of the online market who has already expressed interest in James Joyce or the _Ulysses_ novel.
- Provide a sample Marketing Strategy for the pre-release promotion of the game.
THE GAMING COMMUNITY TODAY

Nowadays it is safe to come to the conclusion that gaming, whether simplex or complex and played via consoles, online or through the medium of phone apps, has moved from a phenomenon enjoyed by few to an activity consumed by many as a form of leisure and entertainment. According the Entertainment Software Association (ESA) the average household “owns at least one dedicated game console, PC, or smartphone” (2013). Some of the top reasons identified by ESA (2001) for gamers to purchase a game include; the “quality of game graphics, an interesting storyline, a sequel to a favorite game, word of mouth”. Developers of any new game must recognize and appeal to at least one of these reasons if they wish to build a user community around a game.

The Entertainment Software Rating Board (2013) identified that on average adult gamers have been playing computer/video games for 12 years. During 2012 in Great Britain, 40% of the online population aged between 16 and 64 played a game online (ISFE, 2012). One reason for the movement of games to a mainstream leisure activity is through the advent of online gaming where people have the capacity to interact, mix and learn in a virtual environment. Based on today’s culture and the advancements in technology, educators must look forward and attempt to incorporate online game components into the knowledge setting, creating a Virtual Learning Environment (VLE) built on serious learning.

SERIOUS LEARNING GAMES

There are a wider range of online games than many people are not aware of; they include advergames, casual games, and for the focus of this paper: serious games. Serious Games have other terms associated with them and can be often referred to as ‘immersive learning simulations’ or ‘digital game based learning’. What differentiates serious learning from other game types is their focus on achieving a specific learning outcome. I-Ulysses is created with the single purpose of providing users with an accurate learning experience of James Joyce’s novel and in particular the Wandering Rocks chapter.

GAME PLATFORMS

Games have many platforms in which they can be created including Arcade, Console, online or Mobile. The realistic choices available to Ulysses are to create a mobile or online game version. In the following text, a description of the two main game platform types available to I-Ulysses is identified and explained.

ONLINE ENVIRONMENT

An online game environment is a game played over a form of computer network which is generally the internet. Online games can range from simple text based systems to games with complex graphics and worlds populated by many players simultaneously. Many online games have communities which build around them forming a social environment in which gamers interact frequently. Online games can range from simple text based environments to ones which
contain a high quality standard of graphics. They can be virtual worlds occupied by many users at a single time. Most online games also have an associated online community in existence on forums or social networks.

Mobile Game

A mobile game is one which can be played on a smartphone or tablet. These games have become extremely popular since the introduction of downloadable content. App Stores such as Apples for IOS devices and the Android App store have significantly changed consumer behavior. This format has coincided with free-to-play games advancement as completing transactions are easy and simple for players to complete.

Because most mobile devices are limited in the resources available to them, mobile games do not have the same standard of features available to them as games designed for PCs and consoles. A wide number of individual platforms and technologies exist for mobile game development with the most common forms being Google’s Android, Apple’s iOS and Windows as the majority of smartphones and tablets are run on these systems.
The Virtual Learning Market

**DESIGNING GAMES FOR LEARNING**

Designing a game for serious learning is a concept which has grown in recent years and due to the visual impact they can have, this is no surprise. When used appropriately, games can clarify traditional concepts which have proved abstract and difficult; and offer independence to learners which results in longer attention spans. The *I-Ulysses: Poetry in Motion* game must serve two purposes of understanding and motivation to satisfy the learning process:

Games can be used to help learners focus on essential formulas, facts and thought processes in order to clarify them. *I-Ulysses* will provide a gamified version of what is commonly known as one of the most difficult, albeit rewarding novels in existence. It will allow learners to develop a greater understanding of the novel in an environment encouraging interaction, discussion and debate.

**Motivation**

The stigma attached to James Joyce’s *Ulysses* concerns its difficulty to read but it is this difficulty that has made it one of the most discussed pieces of writing around the world. In fact only *The Bible* is discussed more often in education. Using a game version will only enhance the motivation of learners to engage on a deeper level with the world within *Ulysses*. This online setting in the form of a VLE will enhance the learning process and motivate an increasing audience to go through the *Ulysses* material.

**VIRTUAL LEARNING**

Virtual learning also referred to as smart education or eLearning is a term used when discussing a learning tool or resource which uses electronic media or ICT to encourage learning. The term is broad, meaning it is often applied to any form of education which uses online or digital technology to educate. Within the general area of virtual learning, you will find many branches using different techniques to encourage education. The *Ulysses* concept seeks to unify a virtual learning environment through the creation of a gamified version of James Joyce’s *Ulysses*. Gamification is the technique of applying game thinking and mechanics to non-game contexts in order to encourage the user to solve problems. The benefits associated with Gamification include:
- User engagement
- Return on Investment (ROI)
- Enhanced learning
- Ability to evolve and stay modern with users changing preferences

*Ulysses* by James Joyce is a novel which chronicles Leopold Blooms journey through Dublin on one ordinary day in June 1904. The book alludes to *Odysseus*, the hero from Homer’s *Odyssey* and creates parallels between the characters and events in Homer’s poem with those in James Joyce’s novel.

Through the Gamification of this famous novel, a new avenue for *Ulysses* fans to explore James Joyce’s work will be available. In initial research of social media communities, it is found there is a significant following of both the author and the book on a global scale.

**VIRTUAL LEARNING ENVIRONMENT**

In the context of this report, VLE will be used to refer to the components online in which interactions occur between one or more individuals and the Joyce learning environment. Education is pushing the boundaries of technology more each year with many post-primary schools predominantly using iPads to deliver lessons. Combining elements of traditional and online learning environments in the creation of a Joyce VLE may indeed be the hinge which makes the world of *Ulysses* available to a new generation of interested learners while engaging existing *Ulysses* readers in a new format.

The primary functions which the Joyce VLE will need to deliver are:

- Controlled access to *Ulysses* themed content which has been mapped to provide users access to extra content using a Downloadable Content (DLC) model.
- Tracking the activity and progress of gamers using DLC and other progress saving elements which makes it possible for the administrators of the game to direct, guide and monitor the ‘serious learning’ development of its users.
- Communication between the user and administrators of the game to provide direct support and feedback for learners as well as the ability for users to communicate and interact with one another.
• Links to other organizational systems such as social media channels, video tutorials on YouTube and a website providing a forum for discussion and feedback.

VLE’s are surrounded by a number of issues affecting the degree of success experienced. These concerns are associated with the lack of interactivity and motivation of users to engage in an ongoing basis. If a VLE does not allow interactivity, it will be unsuccessful. Interactivity is the key component in fostering large environments for knowledge and collaboration.

Through combining virtual worlds with gaming approaches as in the case with *I-Ulysses*, advances in online learning to overcome the issues of a lack of interactivity and motivation will be witnessed.

**Using the Game Approach**

Developers within the gaming world hold a large degree of value to academics in the way they can create a successful game. The strategies observed below in online gaming can be developed and integrated with *I-Ulysses* to create an environment attracting interest and a large user base:

• The content of the game is kept interesting enough so the user continues to revisit and play.
• The game is difficult enough to make it challenging to the user but easy enough so the user does not become frustrated and disengage with *I-Ulysses*.
• Provide users with options for customization leading to replays, user-generated content and in-game feedback.
• Provide free rewards to players such as DLC’s which keeps motivation for advancement high.
• Develop an environment which promotes online communities outside the game such as on social media and a custom built website.

By encouraging these principles within *I-Ulysses*, the game will find itself aligned with the needs of the new learner, a learner who responds positively to high degrees of interactivity, the rewards system and the online community. Using the game approach offers *I-Ulysses* a significant chance for success but the final game quality and marketing approach will play a significant role in building a profitable brand.

Over time a number of novels have been transferred to games with one of the most successful brands being *Tom Clancy’s Rainbow Six*. However these games often are based on the concept of the novel and do not reflect the actual book plot in their delivery. *I-Ulysses* being a game built for serious learning will accurately reflect the *Wandering Rocks* chapter of *Ulysses* and this alone will be one of its most significant unique selling points. Academics and gamers alike will
appreciate the accuracy in the games delivery and this will encourage engagement, referrals and purchases.

**Previous Games based on novels**

Novels such as *The Hitchhiker's Guide to the Galaxy* and *Parasite Eve* have been converted to games over the past number of years. Below I have identified a number of games over the based 20 years which have had a successful transition from a novel.

**Tom Clancy’s Rainbow Six (1998)**

![Tom Clancy's Rainbow Six](image1)

This franchise is one of the most successful in novel to game transfers and still now sixteen years later is continuing to be prosperous with multiple releases for different game platforms since the original in 1998.

**Dune (1992)**

![Dune](image2)

This game although simplistic stays true to the book and is one of the first successful although rudimentary transfers from a novel.
The Witcher (2007)

This was a compelling good/evil based decision making game where users had to make choices which resulted in different gaming outcomes and tested your morals in making you think about the consequences of your decisions.

**SUMMARY**

Other novels including *The Great Gatsby* and *Anna Karenina* have had modified games released based on the original stories but none exist which explore how to immerse the user more in the original story and allow them to develop a more rewarding experience of the original content. *Ulysses* as a game for serious learning will appeal directly to the academic environment where Universities and those engaged with the traditional novel will seek a new technique of analyzing and studying.

**MARKET VALUATION**

*I-Ulysses: Poetry in Motion* is to be based on an online model with a focus on using a substantial downloadable content marketplace to generate sales. A number of online subscription models have been assessed to identify the optimum choice for *I-Ulysses* to pursue.

**GAMING MODELS**

Over the last number of decades, companies have experimented with different models for monetizing the games they release. Some of these models include:

- Retail
- Digital Distribution
- In-Game Advertising
Around Game Advertising
Shareware/Trialware/Demoware (‘Try before you buy’)
Subscription Model
Freemium
Sponsored Games
Pay per play/Pay as you go
Freeware
Pre Sell

These models each have a level of success if used in the right context. For the purpose of this research, the following models will be looked at in more detail. Through initial research they have been highlighted as two models most likely to be successful within the online gaming industry.

- Subscription Model
- Freemium

Subscription

Subscription models have replaced the simple one-time transactions. It has been commonly used in gaming but many would be familiar with its use for services such as Dropbox, Netflix, Spotify and in gaming the Xbox Live service. They are used as they offer a predictable, recurring revenue stream. Although the payment model is simple for users, it can be complex for a company to manage due to taxation in different countries and payment method changes such as card expirations.

In gaming, a subscription model is typically based on a user paying a monthly fee through a direct debit or credit card. Commonly users set up the credit card payments and do not stop them as they wish to keep the game available to play when they want or to keep characters they have created active.

World of Warcraft (fig 4.1) and Conan (fig 4.2) uses the subscription based model to allow people to sign up and play the game. World of Warcraft users wishing to play the game must sign up and pay a monthly subscription in order to pay. Although it still has a user base of around 10 million, many have stopped playing the game due to its business model.
Fig 4.1 World of Warcraft
Freemium

Freemium is term used to describe the business model where you give your core product or service away for free to a large group of users but you make money through sales of smaller premium items to a smaller fraction of the user base. A service familiar to most individuals built on the freemium model is that of Skype where computer-to-computer calling is free but voicemails, calls to landlines and some other products are sold to users.

This business model for online games refers to the game developers allowing players to join or download the game free of charge. This is to encourage greater levels of players. Instead, revenue is sought through in game advertisements and/or in-game sales, such as payments for access to new content, special items, upgrades and expansion packs.

The success of this model is based on the willingness of players to pay for items or access to new content once they have tried the game out and become familiar with it. World of Warcraft is based on the Pay-to-play (P2P) model where players must pay in advance upfront or per month to access the games content.

Games such as Dungeons and Dragons Online (fig 4.3), Aion, and Star Wars: The Old Republic has converted from subscription models to free-to-play with micro transactions to attract back
players who had left the game due to the monthly fee.

Fig 4.3 Dungeons and Dragons Online

![Dungeons & Dragons Online](image)

*Guild Wars 2* (fig 4.4) has built success based on its in-between model of charging an up-front game price with in-game micro transactions but no subscription fee.

Fig 4.4 Guild Wars 2

![Guild Wars 2](image)

This is a growing model and is certainly here to stay with an increasing number of companies and game manufacturers using it as their revenue model.

**SUMMARY**

It is recommended to base the business model on freemium as this is proven in the current gaming market to generate more users and potential revenue. More recently released games have
used models such as free-to-play to attract more players and offer micro transactions for users to access downloadable content such as access to new content or areas on the journey through *Ulysses*. It is recommended that *I-Ulysses* should base their business model on this concept.

In generating a large base for *I-Ulysses*, offering the main game as free-to-play to users would generate initial engagement and through offering a substantial base of downloadable content, it is expected users will return to play the game. Within the freemium model, on average 50% of revenue is generated from just 10% of users who are willing to pay to complete the game or progress to the next level ([www.forbes.com](http://www.forbes.com), 2013).

Regularly updating the game and creating new DLCs such as new streets, character thoughts and character paths will encourage users to stay engaged as they know new content will come. An example which may be used is the thoughts of *Bloom* when he imagines himself in the desert (fig 4.5). Thoughts and pathways such as these can be offered as DLC allowing other landscapes and environments to be available to users in exchange for a price.

**Fig 4.5 Bloom thinking of being in the desert**

![Bloom thinking of being in the desert](image)

At this point in the game, Bloom is wandering around the streets of Dublin. He imagines himself in the desert at one point and later ramifies on the history of the Jews, the pharisee and their persecution. In the next episode Bloom imagines himself on the self-styled pedestal of the New Bloomsuiter. His fantasy of being a supreme ruler, Bloom's thoughts of the dead centroid, purposefully evokes the Irish landscape and Stephen's sections of the book at this point and the reader feels more enticed, a result by comparison with the Irish setting.

**Online Joyce/Ulysses Community**

The online community of *Ulysses* is one whose members interact; share and work together towards goals concerning the *Ulysses* game and book. In this online community, members will be encouraged to engage through social networks, such as Twitter and Facebook as well as in forums, e-mail groups and comment sections of blog posts or YouTube videos concerning the game.
Building an online community for *Ulysses* is integral to its success as this is the location where feedback on the game will be received, engagement between fans will occur and suggestions for game improvements will be made. It is also an excellent location to begin word-of-mouth marketing campaigns.

**SOCIAL MEDIA**

Social media refers to the multitude of available online tools which facilitate people in communicating easily via the internet to share information and resources. Information shared between people on social media can include text, audio, video, images, podcasts and other multimedia communications. For an organization, online media users can become a passionate and enthusiastic audience, prepared to cheer about your business. A brand’s audience can become advocates who influence others to follow the organization and buy into the products and services offered.

Anyone, regardless of experience, can create an online presence, but to create a presence for an organization, requires more effort. To increase visibility, connections and revenue in the long term requires the company to understand its target audience, the trends within the market, and the social media platforms in which the target audience is engaged. The aim of developing a strong social media presence is to cultivate a loyal fan base, which continuously works to promote the brand globally.

The way social media is used constantly changes as new trends rise, popularity of various networks shift and the market evolves. In assessing the potential of a *Ulysses* themed learning environment, the main social media networks have been viewed in their entirety. Fig 5.1 and 5.2 illustrate the main figures concerning Facebook and Twitter as of November 2013 ([http://socialmediatoday.com](http://socialmediatoday.com))
These facts highlighted in fig 5.1 and 5.2 clarify the potential that exists with using social media. Social media generates almost double the marketing leads of a trade show, PPC or telemarketing.
with around 46% of web users looking to social media to decide on their purchase decision. In initial searches of the social media presence of an existing *Ulysses* and James Joyce community, positive results have been found. Below, the figures relating to an online social media presence of *Ulysses* fans can be discovered. Not only are users showing they support *Ulysses*, there is also a high level of engagement, meaning these users will provide an ideal location for pilot testing the game. The key to generating a prosperous impact is the development of a unique brand personality, which resonates with the organization's target audience ([www.investopedia.com](http://www.investopedia.com), 05 January 2014).

**Facebook**

Facebook is the brand window for an organization. It is a combination of a PR department and online fan club, which is open twenty four hours of the day, every day and facilitates the organization to engage with and showcase the company to customers, fans and competitors. It is the most commonly used social networking site and allows organizations with a Facebook page to be found more easily by new and existing customers. The page allows an organization to have as many fans as can be attracted and with search engines also picking up Facebook pages, it gives an organization even greater brand visibility.

Figure 5.1 shows an image of the users on Facebook worldwide who have expressed an interest in either James Joyce or *Ulysses*. As can be seen, there is a minimum member of 854,483 people who have at least expressed an interest in one or the other. This is a huge positive as it shows the potential to build a strong community on Facebook even if only 2% of these users were engaged.

**Fig 5.1 – Facebook Users showing relevant interest**

![Image of Facebook Users showing relevant interest]

There are individual pages on Facebook which have a significant user base in which the *Ulysses* game can channel in building its initial user base. Figures 5.2 and 5.3 show two separate pages on Facebook with the James Joyce page having over 316,000 likes and the *Ulysses* Book page having 103,595 likes proving that an online community for James Joyce and *Ulysses* is already in existence.
Fig 5.3 – James Joyce Fan Page on Facebook

Fig 5.4 – Ulysses Book Page on Facebook
About Ulysses

Book

Ulysses is a modernist novel by Irish writer James Joyce. It was first serialised in parts in the American journal The Little Review from March 1918 to December 1920, and then published in its entirety by Sylvia Beach in February 1922, in Paris. It is considered to be one of the most important works of Modernist literature.

Continue Reading

From Wikipedia, the free encyclopedia  Edit on Wikipedia
Twitter was founded on the principle of a ‘Short Message Service’ (SMS) system to use when communicating between small groups of people. The maximum number of characters permitted in a Twitter message is 140, often compelling the creator of the message to make their point in a short and effective manner. Twitter has a more immediate feed and its real-time features make it more of a constant news feed as opposed to the occasional blog or forum appearance of other social networks such as Facebook and LinkedIn (Jansen et al., 2009).

A unique aspect of Twitter is the ability of its users to ‘retweet’ a message that another user created, allowing the user to share someone else’s ‘tweet’ on their own timeline while still giving credit to the original ‘tweeter’. ‘Retweeting’ can allow certain ‘tweets’ to gain large amounts of exposure, spreading the messages worldwide instantly. A ‘retweet’ carried out by a popular figure on Twitter such as a sports personality or celebrity will increase the likelihood of the message spreading leading to an awareness and development of the brands’ online presence.

Fig 5.5 shows an initial breakdown of some Twitter users and the numbers of followers they each have showing that although smaller than Facebook, a strong and active community still exists on Twitter. If searching for any of these users on Twitter, please place the ‘@’ symbol before their name, for example to find ‘UlyssesLives’ type in ‘@UlyssesLives’.

The James Joyce Centre, James Joyce Museum and James Joyce page all have a prominent number of followers which could be engaged with.

A number of profiles exist on Twitter which directly relate to James Joyce and Ulysses. The user base here is less significant in numbers as on Facebook but shows potential in its ability to develop a strong community of Ulysses advocates. As you can see from the two main social networks that exist, Ulysses and James Joyce have a strong following providing an excellent foundation for I-Ulysses to develop a strong follower base in advance of its release.

FORUMS, WEBSITES AND OTHER COMMUNITIES

From an extensive search of online sites, a number of locations exist which can be used to talk about and promote the game in advance of its release. Ulysses due to its perception by many as ‘unreadable’ has proven to be a focus of many online communities across many locations.

The following list is compiled from a search of forums, groups and websites relating to James Joyce, Ulysses, or the Serious Learning Online Gaming Industry. Each one of the below communities provides a potential avenue for testing, engaging and selling I-Ulysses: Poetry in Motion.

- The James Joyce Society - [http://joycesociety.org](http://joycesociety.org)
- International James Joyce Foundation - [https://joycefoundation.osu.edu/](https://joycefoundation.osu.edu/)
- The Literature Network Forums - [http://www.online-literature.com/forums](http://www.online-literature.com/forums)
- The James Joyce Centre - [http://jamesjoyce.ie](http://jamesjoyce.ie)
Ulysses being one of the most discussed books in existence has led to the creation of a number of online communities which are consistently engaged in Ulysses themed discussions. Some forums exist on sites such as The Literature Network but many specific ones have been created including The Modern World (http://www.themodernword.com/joyce/joyce_communities.html) which provides a number of public lists for people wishing to discuss James Joyce’s work to contact.

Developing an Online Presence

In assessing the potential of I-Ulysses the game; the best method of developing an online presence and building anticipation in advance of the games release is through an integrated marketing strategy of using a website with active blog and social media in the form of Facebook and Twitter. Since the inception of the first social media website in 1997, the concept has evolved immensely over time and came to fruition in 2004 with the development of Facebook. The introduction of social media has changed how people live their lives and how businesses operate online to the extent where now having a social media presence is the norm. I-Ulysses currently do not have an online social media presence and are looking to implement a successful social media communications plan to increase brand awareness within the gaming industry and among the James Joyce community. I-Ulysses will be operating globally, making the use of an online presence more appropriate.

Ulysses will be coming into an industry where games are in the abundance and gamers attitudes and interests are fickle. To stand out, it will need to build anticipation about the game and expectation before it is released. By being based within Ireland and for example with a destination in Inagh Valley, Connemara, it can be marketed as a truly authentic and accurate version of Ulysses. It is hoped users will buy into the story behind the game and the characters of Ulysses before its release to generate quick sales.

The Marketing Plan

To grow the I-Ulysses brand, a marketing plan is a necessity in order to generate sales and interest from the right people. The following section of this research seeks to provide a concise but valuable template to identify the areas in which I-Ulysses must focus to generate interest in the game. An initial SWOT analysis (Table 7.1) captures the main strengths, weaknesses, opportunities and threats which face the brand.
Table 7.1 SWOT Analysis

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognizable brand in James Joyce and Ulysses.</td>
<td>No guarantee that users will purchase DLC from the game. No image as a brand for gaming which may hinder its commerciality.</td>
<td>Potential for more game releases from chapters of the novel. Potential to develop from a game to a movie. Niche market meaning the potential for a highly interactive and engaged user base. Potential to be used as an educational aid for enhancing the learning experience. Penetration of new markets for the Ulysses brand. Potential for linking with the Joyce Centre in Dublin and third level institutions for strategic partnerships.</td>
<td>Other online games perceived as more fun to play may take some of the market. Existing perception as ‘impossible’ to read may negatively impact user numbers. Very niche market meaning a potential low population of users. Without investment and funding, it will be difficult to create a high quality game.</td>
</tr>
<tr>
<td>Popularity of Ulysses as a discussion topic means it has a large community of engaged fans. Vast potential for DLC due to the size and depth of the novel. Dedicated team to provide game updates and new DLC every three months. Superior product to other serious learning games through customer service, graphics and usability. Strong culture and fan advocacy to the Ulysses brand.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**BRAND IDENTITY**

The *Ulysses* brand name was established in 1922 with the release of the original novel. James Joyce and Ulysses are recognizable in all over the world due to the contentious nature of the novel and its popularity for discussion in reading groups and within education. Although keeping the *Ulysses* brand intact for the game version, the name is to be slightly altered moving to *I-Ulysses: Poetry in Motion* which is seen to reflect the movement of this historic piece of writing to a modern digital format.

A brand logo will need to be created to become the focal point of all promotional activity. Famous brands such as Nike, Mercedes and Apple are all brands which can be recognized solely through the logo and *I-Ulysses* will require a strong brand mark.

In drafting the new logo, considerations will need to be made for how the logo is to be reproduced, the color palette and typography for print. Consistency in material will create a
lasting brand image which users will recognize and become familiar with.

**TARGET MARKET**

Some brands would like to include everyone in their target audience which for some can be true. In the case of *Ulysses*, the primary and secondary audiences must be distinguished to develop tailor made marketing messages for each. As a serious learning game, it will be focused outside the areas of primary and secondary education. *I-Ulysses: Poetry in Motion* has a carefully prescribed educational purpose and is not intended to be played primarily for entertainment and so its primary market will be academically focused while the secondary market will be based on casual learners with an interest in *Ulysses* not related to academic purposes.

The Primary Target Market for *I-Ulysses* identified within the research is as follows:

- Third Level Institutions in English Speaking and foreign territories which cover the *Ulysses* novel in its academic courses.
- Academics and students of literature.
- No female or male preference.
- No age preference although it is expected it will only be 18 and over who engage with the game.
- Based predominantly in the UK, Ireland, Australia, Canada and America.

Secondary Target Market identified is as follows:

- Individual casual gamers looking to experience a different gaming experience.

**CAMPAIGN OBJECTIVES**

The goal of the pre-launch campaign is to generate genuine interest in the *Ulysses* game so that a ready-made audience for the product is created. By using Facebook and a website to promote the title, engaging, retaining and rewarding fans in the game will be possible. By building a respectable base to start from, the *Ulysses* game will have an added advantage in trying to generate sales and interest when it is launched. Getting feedback pre-launch is vital in defining new features and improving game play for its fans.

Keeping fans engaged after the launch is then vital to build a long term successful brand. Community features introduced throughout the months following its release can be successful as they allow fans and players of the game the ability to interact with the *Ulysses* team and each other.

- Build a credible *Ulysses* fan base on Social Media to 10,000 individual fans.
• Drive sign ups to a *Ulysses* newsletter of interested users who wish to know when the game is released. It is estimated 1,000 sign ups as minimum would be an excellent start.
• Gain recognition for the quality of the game from famous Joyce enthusiasts such as Stephen Fry.
• Create strategic partnerships with Third level institutions and James Joyce organizations such as the James Joyce Centre who can promote the game to relevant users.

**MEDIA STRATEGY**

It is essential that in the games infancy and pre-release that there is a focus placed on generating a substantial fan base which is engaged with the brand and who demonstrate a potential willingness to purchase the game on its release. With this in mind, it is felt a budget must be put aside for marketing and advertising purposes. Creation of a responsive website, social media channels and appropriate magazine advertisements are all necessary components in building a successful marketing campaign.

**Website Strategy**

There is currently no website for the game; however, it will be necessary to create one. After checking [www.blacknight.com](http://www.blacknight.com), the domain *ulyssesgame.com* has been identified as one which would be worthwhile to buy. The developed website will have a clear design easily showcasing important news, game information, calls to action and behind the scenes content. The design will reflect the *Ulysses* novel but more specifically it will reflect the *Wandering Rocks* chapter which *I-Ulysses: Poetry in Motion* is based on.

The website would possibly contain the following pages:

• **Home**: Brief introduction to the game, with some key pieces of information displayed. It must be attractive enough to encourage first time visitors to look through the website. Testimonials will be found throughout the website as will contact information for user to avail of customer service.
• **Game Guide**: A section dedicated to guiding the user through the world of *Ulysses* from an explanation of Joycean Dublin to bios of the characters with the environments and landscapes explained so visitors can understand the game before they actually play it.
• Community/forums: New and returning users will be able to sign up to the game from this page and view individual profiles and DLCs. Read news and join discussions started by other users or by members of the *I-Ulysses* team.

• Media: The media tab is where game related videos, screenshots, music, artwork, computer wallpapers and fan art will be located. It also a location where blog posts and social media feeds can be streamed through the site.

• Shop: In the shop, users will be able to buy DLC to enhance their gaming experience. Examples of content which can be sold include expansion sets, character outfits and new streets. Over time new chapters can be added as expansion sets.

Blogging is a marketing tactic that uses the creation of content to drive more traffic to a website. It is the process of creating content in a short format which is then stored on a section of the website. Blogging will allow *I-Ulysses* to drive more traffic to its website for free as it keeps it updated and informs search engines such as *Google* that they should be checking it often to see what new content is available. New content consistently will enhance the visibility of the website showing it to more people.

Blogging also aids social media as it is new original content and allows others to share across *Facebook, Twitter, Google+* and *LinkedIn*. Blogging also helps in converting traffic to leads and from there it is the brands job to convert these leads to customers. It also helps establish authority for the brand on a particular topic such as *Ulysses* and drives long term results.

It is recommended *I-Ulysses* takes the following approach to its blogging:

• Minimum of one blog post per week.
• Develop a publication schedule to share between all team members.
• Add social sharing buttons to a blog so visitors to the website can also share on their profiles.
• Encourage comments by asking questions in the blogs.
• Use images and sometimes videos to make blog posts visually appealing.

**Newsletter**

*I-Ulysses* must grow a database of users who are interested in the game release and in playing it so using a newsletter provider such as *MailChimp* ([www.mailchimp.com](http://www.mailchimp.com)) to record the email addresses and names of these individuals is vital. It can be integrated seamlessly with social media channels and your website to attract more signups. It is also free for lists of up to 2,000
subscribers which will prove cost effective in the early stages of I-Ulysses marketing campaign. On the website there will also be links to old newsletters which will build up over time and prove extremely valuable for search engine optimization purposes. The newsletter will be used for the purposes of informing subscribers of news concerning the Ulysses game. As with the website, the newsletter will reflect the I-Ulysses brand.

Social Media

The social media marketing component of the campaign will be the main resource used to build a fan base, excitement about the games release and develop relationships with game users. The social media will require long term commitment and investment in the form of time and a marketing budget.

The plan will be set with the tactical objectives of achieving the following goals:

- Encourage inbound leads to the website at a low cost.
- Engage and excite industry leaders about the game.
- Better understand, identify, and engage potential users of the game.
- Develop strong customer service and satisfaction.
- Build brand awareness.
- Engage and encourage influential public figures to test and promote the game.

Facebook

The strategic objective of developing a Facebook page will be to generate awareness, leads and sales through sharing a combination of relevant links, content, videos and polls concerning the creation of the game. Facebook provides a platform to share artwork, videos, posts, testimonials and behind-the-scenes exclusives to a growing number of interested fans. Sharing the visuals behind the game is what attracts interest as people feel a part of the building process. A budget for carrying out strategic Facebook advertising campaigns must be set aside to use in targeting fans of Ulysses and James Joyce.

A conscious effort to engage fans of gaming and Ulysses with the actual production of the game is needed and the following content can be used:

- Bios of the main characters of the game
- Drawings and interviews with the main people behind the game itself including Simon Colreavy-Donnelly, Sean Crosson, Valerie Butler and Brian Caraher with further investment bringing in other talented parties behind the game to
• In-game snapshots shared to allow exclusive access.
• Video trailers of game scenes and behind the scenes footage.

The gaming community is very interested in what goes on behind the scenes so allowing them access to this will encourage engagement and increase the following. This is why it is important to not only post about the Ulysses game but also post about James Joyce and Ulysses in general as well as other news in the gaming industry. This will aim to attract people and get them to follow the games page and website.

Successful online communities for games include World of Warcraft which on Facebook has a fan base of 5.4 million people that users video trailers, character biography’s and customer interaction as the main focus points for engaging their audience. Fans often send in their own drawings of characters which the page reposts usually leading to large scale engagement as it is genuine original content.

![Fig 7.1 World of Warcraft Facebook Page](Image)

**Twitter**

In creating an account on Twitter, I-Ulysses will be provided with instant access to a community where it can engage with followers expressing interest in Ulysses and James Joyce. Game updates and news will be shared where possible. Twitter will be used as a customer service tool to aid the overall brand image of I-Ulysses in the creation of a strong brand image. Some of the strategies to employ on Twitter include:

• Follow users which may become customers.
• Follow influencers and Joyce community organisations.
• Share original information from the website to drive traffic.
• Share content from other parties to drive conversations.
• Retweet other tweets concerning gaming, James Joyce and Ulysses.
• Tweet at least once a day on average.
• Monitor Twitter to identify potential gaps for responding to tweets (e.g. discussions on Ulysses)

In focusing on building anticipation for the game, it is adjudged that public figures with strong fan bases would provide a pivotal role in attracting a fan base. Some appropriate figures which will be targeted include Stephen Fry (Actor, Public Fan of James Joyce) who has a large follower base on Twitter and Phil Campbell who is a famous gamer that can introduce the game to an online gaming community:

Fig 7.2 – Stephen Fry’s Twitter Page
Both of these individuals have merits to contacting. Stephen Fry has a strong following base with many of his followers actively taking his suggestions on board. Having Stephen Fry as a promoter of the game would prove invaluable to its success. At a later stage in the game’s progression, an attempt will be made to contact him and get him to test the game. Phil Campbell is a famous creator of games and would have instant pull and access to a serious gamer community which would potential pick up the Ulysses game.

**Other Networks**

At this stage in the I-Ulysses development it would be counterproductive to focus on other social media networks outside of Facebook and Twitter. Other channels including Google+, Pinterest, LinkedIn and Instagram will be assessed further in the development of the I-Ulysses brand. A YouTube channel will be created but only used as a location for uploading original content for embedding on the website and sharing on the primary social media networks.

**SUMMARY**

A minimum of six months will be required before the launch of the game to build a reasonable online following. Then in launching the game, an active base of followers will be waiting to purchase or download the game on its release. By providing a long wait of anticipation for the game, fans will be eager to play and by providing them with such an insight into the game’s production, they will feel they had some ownership in its creation.
Conclusion

This report provided an introduction into the feasibility of developing a Virtual Learning Environment (VLE) in the form of an online game around the Ulysses Novel by James Joyce. From the research carried out, it can be observed and concluded that a strong online community exists around James Joyce and Ulysses. It can also be concluded that a novel can be successfully converted to a game if it stays true and accurate to the plot depicted in the novel. An online community can be successfully built in advance of the games launch through strategic thinking, a budget and a committed team who are willing to engage with social media to encourage its success. Finally it is deemed by the researcher that the most suitable business model for the game is that of a freemium business model based on a game either distributed in the form of a downloadable app for smartphones and tablets or an online game which can be accessed through the internet with individual login details for each user.

Through the integration of a modern, clear and responsive website with an active social media presence on Facebook and Twitter and an email newsletter system, I-Ulysses will be able to strategically target relevant potential customers and use engaging content to stir up interest in this serious learning game before it is released. Academics and game developers in successful collaboration will be able to provide the most engaging and effective learning experience as will be in the case of I-Ulysses: Poetry in Motion.

In assessing the overall feasibility of a Ulysses themed learning game for the serious learning marketplace, it can be seen that a substantial potential customer base pre-exists online in communities on Facebook, Twitter and specifically created website forums and chat rooms. Depending on the final quality of the game to be released and the serious learning market for which it is targeted, an online internet enabled game platform based on the freemium business model where users pay for micro transactions is most suitable to generate revenue.