THE USE OF DIGITAL GAMES IN PARTICIPATORY PLANNING PRACTICES

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Abstract

The past decade has seen a gradual but steady increase in the use of games in participatory planning practices. Since the ‘Gamification’ gained momentum, the thoroughly thought-through simulation and gaming discipline of the 1970s has been replaced by an amalgam of confusion and optimism about the role and added value of games in planning practice. The lack of clarity about what games really are and the scarcity of studies on how they can be used in dealing with contemporary participatory planning concerns have limited the use of digital games in planning to pedagogic and communication purposes.

This research contributes to debates on the role and added value of digital games in participatory planning practices by unravelling the types of knowledge that can be produced by digital games and the many ways in which data flows happen between the real world and the imaginary world of games. To do so this research focuses on the epistemological analysis of digital games and core concepts of participatory planning, democracy and power, using a four-staged problem-centred Design Science Research (DSR) approach; 1) it first explores the existing limitations and potentials of the use of games in scientific fields in general; 2) it reviews the role of knowledge in participatory planning practices and its consequent effect on the defined role of games; 3) it proposes a new framework for using games as a research tool in participatory planning which conceptualizes games as artefacts with embedded information system; 4) it validates the framework by designing, testing and evaluating a game, called Mythoplastis with the aim of capturing the perception of the public about various locations in Manchester, UK.

The study concludes that while games are powerful tools for capturing mental model of their players, the dominant gaming and simulation legacy and the emphasis on the scientific validity measures cease planners to be open or receptive to the artistic values of digital games and their potential in being used as research tools. It shows that by bridging the gap between commonly ignored theoretical and practical efforts of main stream game designers with the serious game design frameworks, new conceptions and roles of games can be explored. The designed game, Mythoplastis, shows how real world data can be abstracted in the game world for research purposes. It is also argued that for participatory planning to move beyond generalized and deterministic discourses about the role of planners and supporting tools, it is crucial for planners to re-examine the role of knowledge and validity measures in the conception of participation in planning.
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Chapter 1

INTRODUCTION

1.1. Context of the Study

“The modern city, from being the walled, defended site of staying, becomes an attractor of flows, a node in a dynamic system of trajectories, characterized by complex codification of access procedures and sensorial overstimulations” (Hutchison, 2010, p.140). It is this modern city with its unique characteristics that becomes the birth place of cinematic cities, spaces between the real and reel; constructs “not only that which appears on the screen, but also the mental city made by the medium of cinema, and subsequently re-experienced in the real private and public spaces of the city” AlSayyad (2006, p.2)

In the 21st century, with the pervasiveness of ‘New Media’, cities are experiencing new forms of sensorial overstimulations and once again the discussions about in-between spaces, the actuality of virtuality and understanding new forms of visual arts are gaining momentum.

New Media, communication technologies that allow or facilitate interactivity among users or between users and information, have revolutionized the way the content of media is acquired, manipulated, stored and distributed (Lister, 2009; Rice, 2007; Wardrip-Fruin & Montfort, 2003). They have blurred the line between producers and consumers of the media and between reality and virtuality (Lister, 2009; Rafaeli, 1988). New Media, including social networks, websites, blogs and video games, are often defined with their four unique qualities; being procedural, participatory, encyclopedic and having spatial properties (Wardrip-Fruin & Montfort, 2003). It is these qualities of New Media that have made them known as ‘technologies of freedom’ (Pool, 1983); asserting the belief that by making means of communication dispersed
and decentralized and by enabling collective production and collective meaning-making, new media are bearers of new collective intelligence, freedom and democracy (Dahlgren, 2009; Jenkins, 2006; Langlois, Elmer, McKelvey, & Devereaux, 2009; Tambini, 1999). The participatory qualities of New Media have been highlighted in many fields. In fields such as urban planning that are struggling to provide easy-to-use meaningful engagement tools, these participatory qualities of new media and their potentials in fostering democratic values have opened a wealth of new possibilities for designing participatory planning tools (Innes & Booher, 2000). In the past decades, the added value of web 2.0 technologies and other forms of new media such as websites and social networks are extensively studied by planning scholars and practitioners; studies on web-based public participation geographical information systems (Coleman & Gotze, 2001; Kingston, Evans, & Carver, 2003; Rinner, Keßler, & Andrulis, 2008), urban 3D modelling and the creation of digital space (Hudson-Smith, 2007), citizen science (Bonney et al., 2009; Irwin, 2001) and smart cities (Batty, 2013) are just a number of examples of topics which are covered in this strand of studies.

In a new trend however recent years have seen an increased interest in the use of digital games in participatory planning practices (Poplin, 2012, 2014; Reinart & Poplin, 2014). The emergence of casual mobile gaming, social network gaming, the success of massive multiplayer online games (MMOG) and the historic link between games and planning are known to be the driving forces behind the increasing interest in the use of digital games in planning practices. Despite the fast adoption of digital games in planning, few studies have been undertaken on how they are used in planning processes and what their added values really are for participatory planning.

1.2. Digital Games in Urban Planning Toolbox

Game science (the scientific study of games and simulations) emerged in the 1940s (Mayer, 2009) with the work of Morgenstern and Neumann (1944) on theory of games. In the 1950s the advances in management science, computer technologies and decision science made design and application of management and business games and simulations possible (Klabbers, 2009; Mayer, 2009). With the failure of large scale simulation models in addressing social complexi-
ties, attention was increasingly paid to developing new scientific methods for understanding complexity of social issues. It was in this context that ‘Simulation and Gaming’ emerged as a field on its own (Inbar & Stoll, 1972; Mayer, 2009); digital games could not only be used to perform experiments without interfering with real-life systems, but also as a ‘safe’ learning environment. They were believed to be able to facilitate the exchange of knowledge between the experts and the public (Klabbers, 2009). The term ‘serious games’ was then introduced to distinguish games that are designed purely for entertainment purposes from those that had a specific educational aim (Duke, 1980). Several educational games were successfully designed and used in the urban planning field as part of the simulation and gaming trend. However, the use of digital games for research purposes to better understand system behaviour and social complexities remained unexplored.

In the 2010s the second wave of interest in the use of games in planning processes emerged as a result of the then-increasing popularity of the storytelling paradigm and the success of ‘Gamification’ trend in the advertisement and business studies. The ‘Gamification’ trend started in 2009 with Four-square; a location-based social network mobile application which applied three ideas that made it different from other platforms; points, badges and leadership board (Cramer, Rost, & Holmquist, 2011; Lindqvist, Cranshaw, Wiese, Hong, & Zimmerman, 2011). These features were later called game-elements and the ‘Gamification’ trend defined itself as using the game elements in a non-gaming context (Deterding, Sicart, Nacke, O’Hara, & Dixon, 2011). It was in this context that the theories and methodologies on the use of digital games in the planning field were revisited; however this time rather than emphasizing the procedural qualities of digital games as was the case in the ‘Simulation and Gaming’ tradition, urban scholars and practitioners focused mainly on the participatory qualities of these new media (Poplin, 2014).

The study of the use of different types of games in participatory planning is still in its early stages. The effort to design games related to planning issues vary in their scope and focus; some are purely educational and focus on teaching their players about the complex nature of urban planning issues; while others are focused on the use of games in focus groups and community meetings to facilitate negotiations by adding the element of playfulness to the process and some (known as pervasive/street games) are designed purely for en-
tertainment purposes but they are performed in urban spaces. Despite the increasing interest in the use of games in planning, few studies have been undertaken on how and to what extent digital games can help planners and communities in fulfilling their tasks.

1.3. The Added Value of Games as a Participatory Planning Tool

According to Poplin, games in planning are mainly designed for “educating citizens about their environment and at the same time enabling them to express their opinions in a pleasant, enjoyable, and engaging way” (Poplin, 2014, p. 494). According to the author (Reinart & Poplin, 2014) digital games in participatory planning enable transmission of knowledge, participation, interaction and learning. In a similar vein, very often digital games in planning are categorized along with digital storytelling technologies and mobile media as tools that can be used to create social interaction. The effectiveness of these games in increasing participation and consequently in enhancing the democratic nature of planning practices is trumpeted in almost all the works on the use of games in planning (Diamantaki, Rizopoulos, Charitos, & Tsianos, 2009; Matyas et al., 2009; Poplin, 2014) but there is hardly a clear set of indicators against which these successes are measured. It is not clear for planners when and why games should be used in planning processes, how they differ from other available tools (e.g. Planning Support Systems (PSS)), and what sorts of questions they can answer in a planning context.

While the added values of technologies such as GIS and PSS have been studied extensively in the past decades (Briggeman, 2015; Pelzer, Geertman, Heijden, & Rouwette, 2014; Pelzer, Geertman, & van der Heijden, 2016), the study of digital games and their added value for planning lags far behind their supply. Furthermore few studies (Peters, Vissers, & Heijne, 1998; Schlenker & Bonoma, 1978) have attempted to explain why, despite the advances in available tools and technologies, games are very rarely being used for research purposes; they are mainly for transmission of knowledge rather than its production.

In this research it is argued that the lack of a critical understanding of digital games as a medium, the sort of knowledge they produce, the types of data
they can handle and the way they deals with in-between spaces of reality and virtuality has led to the limited use of digital games in the context of participatory planning practices. This critical understanding, however, will not be possible without understanding the complex nature of participatory planning in the context of the new information age.

In discussing the broad implications of new technologies for problem solving, Frase (2016) points out that technology sets the parameters of possibility but does not necessarily change the way problems are solved. The same argument is valid for the use of digital games in participatory planning. If games are to provide new ways of dealing with participatory planning processes, then a better understanding of the possibilities they can offer is required. This study aims to understand these possibilities through reaching an epistemological understanding of the use of digital games as a medium and the ways in which it can help foster democratic values in planning (Figure 1-1). To better situate games within participatory planning toolkits it is crucial to understand the potentials and limitations of digital games as a medium, what they are and what types of knowledge they can potentially produce, how these types of knowledge influence and get influenced by the conception and practice of democracy and how these conceptions are then reflected in participatory planning tools and theories.

![Figure 1-1: Core Literature Themes](image-url)
1.4. Research Aim and Objectives

This study aims to critically examine the use of games in participatory planning practice and to identify opportunities for enhancing the use of games in the participatory planning field. To achieve this aim, following objectives and questions will be dealt with.

**Objective One:** To understand the potential and limitations of digital games

**Objective Two:** To understand the bottlenecks and deficiencies of current practices in the use of digital games in participatory planning practices

**Objective Three:** To devise a framework for conceptualizing and analysing the use of games as a research tool in participatory planning practices.

**Objective Four:** To test the devised framework by designing, developing and implementing a game that can be used for research purposes in participatory planning practices.

**Objective Five:** To reflect on the potential and limitations of the devised framework and possible future improvements.

Figure 1-2 illustrates the relationship between the objectives of the research and the thesis structure.

1.5. Structure of the Thesis

After an introduction to the thesis, chapter 2 outlines the research methodology by setting out the research design and philosophy. It explains how the Design Science Research (DSR) approach is used to achieve a better design of games as research tools in participatory planning practices. The chapter then explains what the research process is and what methods are employed to help achieve the objectives of this research.

Chapter 3 seeks to understand what digital games really are and how their capacities and limitations as a medium can be understood. To do so, the nature of digital games as a medium and their historic role in scientific fields such as planning are critically examined. It explains how the use of games and their conception in scientific fields such as planning has been influenced by the
emergence of decision sciences and the dominance of systems thinking in 1970s. The chapter then explores how the conception of games in scientific fields differs from the conception of games in mainstream game design practices and how these differences influence the usability and perceived added value of games in scientific fields.

Chapter 4 provides an overview of arguments surrounding the nature of problems that are addressed in participatory planning practices. The critical role of knowledge in shaping different types of democracy is reviewed. The chapter then explores the ways in which different formulations of democracy have shaped theories and practices of participatory planning. Arguments surrounding the role of knowledge in planning are critically examined and it is explained how games can help planners in collecting and using these different types of knowledge. To better understand and situate the games within the planning toolbox, the past and current practices of participatory planning, the state of digital game industry and patterns of media consumption in the UK are reviewed.

Chapter 5 begins by outlining the design problems and introducing the development lifecycle. The chapter provides detailed information on the design process and the specifications of the proposed game, Mythoplastis. It introduces a design framework that bridges the gaps between serious game design and mainstream game design frameworks. This chapter discusses how different tools and techniques for abstracting the real world data in the game world are used and tested in the design iterations. A detailed explanation of different design specifications (including interactivity, storyline, game mechanics and technology) in the first playable version of `Mythoplastis' is also provided. It is also explained how the technologies for implementing the game are chosen and how the system architecture of first playable version of Mythoplastis looks like.

Chapter 6 reports on the process and results of the evaluation of the first playable version of Mythoplastis. It explains how the added value of the game was perceived from different points of view (game designers, planners and the public) along with a discussion on suggested changes to improve the design and utility of the game.

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1 Mythoplastis in ancient Greek refers to the act of creating Myth or Fiction. The title reflects the main storyline of the game as the players are asked to either tell real stories or to make up stories about series of locations in their neighbourhood.
Chapter 7 revisits the theoretical framework of the research and the discussions on the interdependencies of the key themes of the research posited in Chapter One, reflecting on the identified problems and the usefulness of the proposed framework in Chapter Three for conceptualizing games. To do so, the chapter begins with a brief review of the key themes of the research and the proposed framework for understanding digital games. In light of the findings of the research, the chapter then reflects on the limitations and capabilities of digital games as a medium, how the use of digital games in participatory planning practices is affected by the participatory planning theories and the current conception of democracy in planning practices and how the game can better be situated in the participatory planning toolbox.

Chapter 8 as a conclusion summarizes the research objectives and key findings. It discusses how the findings of this research can contribute to a more thoughtful, innovative use of games in participatory planning processes along with a discussion on how the findings of the research can be used for future studies.
Figure 1-2: The Relationship between the Research Objectives and Thesis Structure

- **Objective One**
  - Chapter Two: Review of Current State of Use of Games in Planning Practices
  - Chapter Three: Limitations and Potentials in Current Use of Games in Planning

- **Objective Two**
  - Chapter Four: Literature Review on Games (What They Are and How They Work) to Find Potential Solutions
  - Chapter Five: Understanding Different Conceptions of Games

- **Objective Three**
  - Chapter Six: Proposing a Solution by Suggesting a New Conception of Games
  - Chapter Seven: A Framework which Illustrates Different Use of Games Based on the Planning Process in Which the Game is Being

- **Objective Four**
  - Chapter Eight: Conceptualizing the Solution
  - Chapter Nine: A Game Documentation which Explains the Design Space, System Specification and Development Requirements

- **Objective Five**
  - Chapter Ten: Devise a System Design in Which Ideals of the Framework Can Be Incorporated
  - Chapter Eleven: Developing the First Version of the Game

- **Objective Six**
  - Chapter Twelve: Playtesting the Game
  - Chapter Thirteen: Reporting the Results of the Playtest and Developing the Second Version of the Game

- **Objective Seven**
  - Chapter Fourteen: Discussions on How the Game Can Be Improved

- **Chapter Six**
  - Chapter Fifteen: Understanding Different Conceptions of Games
  - Chapter Sixteen: Limitations and Potentials in Current Use of Games in Planning

- **Chapter Seven**
  - Chapter Seventeen: Proposing a Solution by Suggesting a New Conception of Games
  - Chapter Eighteen: A Framework which Illustrates Different Use of Games Based on the Planning Process in Which the Game is Being

- **Chapter Eight**
  - Chapter Nineteen: Conceptualizing the Solution
  - Chapter Twenty: A Game Documentation which Explains the Design Space, System Specification and Development Requirements

- **Chapter Nine**
  - Chapter Twenty-One: Devise a System Design in Which Ideals of the Framework Can Be Incorporated
  - Chapter Twenty-Two: Developing the First Version of the Game

- **Chapter Ten**
  - Chapter Twenty-Three: Playtesting the Game
  - Chapter Twenty-Four: Reporting the Results of the Playtest and Developing the Second Version of the Game

- **Chapter Eleven**
  - Chapter Twenty-Five: Discussions on How the Game Can Be Improved
Chapter 2

METHODOLOGY

2.1. Introduction

This chapter provides an overview of the research design and methodological approach taken in this study and the logic behind them. The chapter begins by outlining the research philosophy and the expected flow of the research. This is followed by a more detailed examination of the research objectives and questions. The chapter then explores the possible methodological approaches. It explains how the Design Science Research (DSR) approach is used to achieve the objectives of the study. The chapter is concluded by providing the detailed structure for operationalizing the research methodology.

2.2. Research Philosophy and Design

Given the defined aim and objectives, the overarching research strategy adapted in this research uses the DSR paradigm. The dominant approach to developing tools and models in the field of communication technologies, computer science and information systems focuses on ensuring the validity and reliability of the tool rather than its practical utility (von Alan, March, Park, and Ram, 2004). The same can be said about the planning supporting tools. In 2005 Vonk et al. (2005) identified the mismatch between the needs of planners in practice and the tools which are designed as one of the main reasons behind the underuse of planning support systems. The DSR, however, focuses on creating utility through focusing on human purposes and
stakeholders (March and Smith, 1995); it is an approach to solve practically relevant problems (McKay and Marshall, 2005).

Epistemologically DSR is mainly used within the Interpretivist research philosophy (Goldkuhl, 2012). The basic premise in interpretive approaches is that reasoning always occurs in the context of agent’s web of belief (Bevir & Rhodes, 2015; Williams, 2000) and so reality “is essentially mental and perceived” (Hudson & Ozanne, 1988, p. 509). In this way, interpretive approaches try to “avoid reification and determinism by referring to common meanings and allowing for agency” (Bevir & Rhodes, 2015, p. 15). The theoretical agenda of Interpretivism has been adopted in many fields including politics, computer science and communication technologies and therefore the Interpretivism philosophy adopted will impose certain implications on how the main concepts in this research are defined. The adoption of Interpretivist ideas in science and technology studies has led to emergence of theories on human-centric designs; taking into account the centrality of human understandings of symbols, usability and needs (Walsham, 1995). On the other hand the core idea of Interpretivism in politics is “how people see their position and interests depends on their theories, not our theories” (Bevir & Rhodes, 2015, p. 5).

In contrast to traditional research approaches that focus on exploring or confirming hypotheses, the DSR approach is exploratory in nature and first emphasizes clarifying the goals of the artefact which is to be designed and then on building and carefully evaluating the utility of it (Hevner et al. 2004; Venable 2006). According to Hevner and Chatterjee (2010, p. 15):

“Design as research encompasses the idea that doing innovative design that results in clear contributions to the knowledge base constitutes research. Knowledge generated via design can take several forms including constructs, models, methods, and instantiations (March and Smith, 1995). Design research projects are often performed in a specific application context and the resulting designs and design research contributions may be clearly influenced by the opportunities and constraints of the application domain”.

The focus of DSR is on improving the context or the environment that the artefact is supposed to be used in by introducing new artefacts, processes and models. However there are several outcomes that can be achieved
through DSR (Peffers et al., 2006); the research can seek to formulate the problem; it can have a specific objective (solution) at hand (such as improving the tool) and uses research to achieve that objective. It can be focused on the process of design and development (optimizing processes) or it can be focused on the practical evaluation of a given solution. Given that few studies have been undertaken on the use of games as research tool in planning, this research takes a problem-centred approach; throughout the research the gaps and limitations in the use of games in participatory planning practices are identified and potential solutions are provided and tested.

Following Hevner’s model (2007) for problem-centred design research three cycles of DSR (rigor cycle, relevance cycle and design cycle) should be taken into account (Figure 2-1). The Rigor Cycle connects the design science activities with the knowledge base of scientific foundations, experience, and expertise that informs the research project. The Rigor cycle is there to make sure that the past knowledge in the field is incorporated into the design of the artefact. In this research, the Rigor Cycle mainly aims at understanding the games as a medium and their use in scientific fields.

The Relevance cycle then deals with understanding the contextual environment and activities of the research projects. It is crucial that the research starts with understanding the context of the design; “identifying and representing opportunities and problems in an actual application environment” (Hevner, 2007, p. 88). At the end of this cycle it should be clear for the researcher what the problem at hand is, what opportunities exist there in the environment for devising a solution, how the designed artefact is supposed to
improve the environment, and how this success is measured. Therefore the relevance cycle in this research tries to outline the opportunities and the problems which exist in the use of digital games in the specific case of participatory planning practices. The Design Cycle which is the central part of the DSR iterates between the core activities of building and evaluating the design artefacts and processes of the research. According to Simon (1996) the nature of this cycle is the iterative process of generating design alternatives and evaluating them. In effect iterative game design approaches are adopted in the design cycle of this study to achieve a solution to the identified problems in the rigor and relevance cycle.

2.3. Research Questions

This study aims to critically examine the use of games in participatory planning practice and to identify opportunities for enhancing the use of games in the participatory planning field. Following the DSR approach and having the required outcomes from each phase of study, the objectives of the study and questions are defined as follows.

Objective One: To understand the potential and limitations of digital games

- How are games conceptualized and defined in mainstream game design and serious game design literature?
- What sorts of knowledge can games generate or use?
- What are the unique qualities of digital games compared to other existing 'New Media'?

Objective Two: To understand the bottlenecks and deficiencies of current practices in the use of digital games in participatory planning practices

- Are there any path dependencies in the case of use of games in participatory planning practices?
- What are the perceived values of expert and lay knowledge in participatory planning practices?
• What are the current uses of games in planning practices?

• What are the added values of games in participatory planning practices?

**Objective Three: To devise a framework for conceptualizing and analysing the use of games as a research tool in participatory planning practices**

• How can the concerns of real world participatory planning be incorporated into the design specifications of the game?

• How can the in-between space of imaginary world of games and real world of planning be dealt with in the design to ensure an effective design?

• What are the roles of planners, designers and planning in the games for participatory planning practices?

**Objective Four: To test the devised framework by designing, developing and implementing a game that can be used for research purposes in participatory planning practices.**

• How can the aspects of the conceptualized games be reflected in the design of the game?

• What genre of game, technology and game mechanics are needed for a game to provide the planners with the knowledge they need?

• What development framework can be used to ensure the efficiency and effectiveness of the design?

**Objective Five: Implementing and reflecting on potentials and shortcomings of the designed game**

• What playability and usability measures can be used to evaluate the designed game?
• What is the perceived usefulness of games from the planner's point of view?
• What aspects of the proposed designed have failed and how they can be fixed?
• What lessons planners can learn from the game design processes and concepts?

2.4. Research Methodology

In 2006, Peffers et al. devised a comprehensive methodological cycle for DSR studies (Figure 2-2). Following the general design cycle pattern this process starts with problem identification and setting objectives and it ends with evaluation and release of the final product.

2.4.1. Rigor Phase; Defining the Gaps in the Practice of Games in Planning

In this phase of research the state of knowledge on the use of games in scientific fields in general and in the urban planning field in particular is explored. A historic review of the use of games in the urban planning context is used to explain how games are conceptualized in scientific fields; how this conceptualization has evolved and how it differs from the ones which are used to create games for pure entertainment. In this sense given the exploratory nature of this research, to better understand the existing gaps in the use of games in scientific fields, the review of theories and practices also includes the games which are designed for pure entertainment purposes.

A literature review is the main methodology which is used in this phase. The technique to use for performing a systematic literature review very much depends on the extent to which the research domain is recognized by
Figure 2-2: Design Science Research Cycle

Source: (Peffers et al., 2006)
keywords in academic databases and the clarity of the terms. With the emergence of game studies as a field in its own right, the theories and methods of game design for serious games have been well discussed in scientific literature. However the majority of literature on games which are designed for entertainment purposes does not make use of scientific analysis to present their findings. It is also crucial to point out that despite the rich body of literature on serious games there is hardly any consensus among scholars on the main terms which are used in the field (Perron & Wolf, 2009); very often digital games, games, interactive systems and playful systems are used interchangeably to refer to very similar entities.

Given the ambiguity surrounding the terminology used in the field, the use of systematic literature review techniques which are purely based on searching for keywords provide us with very limited scope. To make sure that this research covers a variety of literature the snowballing technique is used in the literature review. To identify the theories and practices of serious games in planning the search initially started with inquiring [“serious games” AND “urban planning”] in publication databases. The first results from the databases were then used as a starting point for a snowballing process. The main theories behind serious game design were then defined by identifying the key references in the serious game design literature.

For the case of games which are designed for entertainment purposes, the publications and the presentations at the two main conferences on the digital games (Game Developer Conference (GDC) and Digital Games Research Association (DiGRA)) were chosen as the starting point. In both cases following the snowballing approach as shown in figure 2-3 further literature was found and reviewed.

Given that at this stage of the research the focus was mainly on understanding the role of serious games in planning, certain inclusion and exclusion criteria were used: although the focus of this study is mainly digital games, to better understand the differences between the digital and traditional games the search includes any types of serious games in planning, general game design concepts and theories, regardless of the medium on which the game performs. Specifically in the case of games for entertainment only those studies are taken into account that directly tackle the conceptualization of games and
game design theories. Studies which are focused on technical aspects of the games are excluded in this stage of research.

2.4.2. Relevance Cycle; Participatory Planning and Game Design

In the relevance cycle of this research the relevance of use of digital games for participatory planning practices is studied. The main aim is to identify the nature of problems that are tackled within participatory processes, the types of knowledge that are used in the processes, the way it is integrated into general planning processes and the various roles which are assigned to experts and the public. Using the outcomes of the rigor phase then it would be possible to outline the added value of digital games for participatory planning practices.

On the other hand given that the designed product in this research is being tested in the context of England, the study should take into account participatory planning practices and regulations and the existing media consumption patterns in the context of the England. This includes reviewing the existing policies on how and when the public should be involved in planning process-
es and understanding the potentials that exist in the current England’s participatory planning system. This information is collected through reviewing policies and papers which address the current state and ideals of community engagement within the England’s planning system.

2.4.3. **Design Cycle; Game Design for Research Purposes**

In this stage the outcomes of the previous phases are used to define the design problem and to provide solutions in the form of an online game. Given that digital games are often discussed as software with art, audio and gameplay, the evolution of game development processes parallels the changes in the software development paradigm. The overall design process in this research is constructed using a mixture of Agile (Beck et al, 2001) and Waterfall (Royce, 1970) processes and uses rapid prototyping techniques to optimize the design solutions.

The waterfall model was developed in the 1970s in the software development field. This model is a seven-step process without any iterations; it starts with defining system requirements (conception) and ends with the release of the final product (Davis, Bersoff, & Comer, 1988). The model puts a lot of emphasis on defining the system requirements and documenting them to ensure that all the desired ideas are reflected in the design of the final system. The post-production phase in this model is mainly about testing the system and evaluating it. When formalized development processes for games were called for, this model was adopted by many gaming scholars and to date it has remained one of the most commonly used models in serious gaming design and development. Duke’s (1980) nine step model (figure 2-4) which is used now by many serious game designers is one of the most well-known examples of this approach.
In the 1990s, in response to criticism about inflexibility and the high cost of the waterfall methodologies, Agile models were introduced in software development. The agile methods are mainly characterized by their iterative processes and their flexible responses to change (Abrahamsson, Salo, Ronkainen, & Warsta, 2002). They break the tasks into small increments with minimal long-term planning. McGuire (2006) describes agile processes in game design as follows:

"Agile puts the emphasis on producing demonstrable iterations of a game almost immediately into production, creating prioritized vertical slices that iterate on the most critical elements and features" (McGuire, 2006)

In this sense, in the agile process at the end of each iteration, there will be a deliverable. In software engineering this would be a working part of the software or system. In gaming, at the end of the each iteration, it is expected to have a ‘playable game’ (Palmer, 2014). This playable game should include the main elements of the desired design which the team has agreed on but it does not necessarily have to meet all of the quality standards of a deliverable game for the market. In this project, considering the defined aim and objectives, a mixture of the waterfall and agile approach is used (Figure 2-5). This process has five main stages; definitions phase, iterations and paper prototyping, implementation, playtesting and revise.

Figure 2-5: The Development Lifecycle
2.4.4. Definition Phase and Game Principles

In this phase the outcomes of the rigor cycle and relevance cycle are used to define the design problem. The main task in this stage is defining the design space of the game and the game principles. The most abstract level of game design deals with defining ‘design space’ (Harteveld, 2011; Klabbers, 2009). The game’s design space mainly focuses on defining what external factors can influence the whole process and aspects of the design and how the game as a product relates to its external world and its users. As Salen and Zimmerman (2006) argue, through the game design process we better understand “the complex relationships between player and designer, and the culture of game development itself” (Salen & Zimmerman, 2006, p. 21). Understanding the design space helps the designer to identify what the aim or ultimate goal of the design is, what the role of the designer is in the process and how the designed product is seen within the world in which it is being designed. Three main aspects of design space are defined in this stage: the relationship between the real world and the game world, the relationship between the player and the designer and the relationship between the player and the game. The aspects of the design space are then reflected in the game principles; aspects of the design which needs to be remained unchanged during the iterations.

2.4.5. Iterations; Game Documentations, Storyboard and Paper Prototyping

The main aim of this phase is to find the right balance between the message and the representations used in the game through iterations. It is important to check in each iteration that the storyline, user interface, the missions, levels and the produced outcomes of the game are in line with the defined aims and principles. In each iteration the specifications of the game are documented on paper and a storyboard is created. This is done through what is commonly known in the game design process as ‘paper prototyping’ (Snyder, 2003). The results are then evaluated using ‘Alpha Testing’ or ‘internal design review’ which is usually done in house, among the small number of playtesters (Bethke, 2003). Considering the limited time frame in this research, a maximum of two iterations are expected to be done in this phase and by the end of this phase, specifications of gameplay, game mechanics, storyline,
player's role and the user interface graphics should be clearly defined and illustrated.

In this phase the study make use of game design patterns as well. In 2004, Bjorke and Holopainen (2004) introduced the concept of ‘patterns in game design’. In their attempt to achieve a common language for game design they looked for certain combinations of game elements that are repeatedly used in different game designs. For example they argue that a combination of certain types of game mechanic elements results in different genres of the game. The idea behind using patterns is not to repeat tested and successful cases of game design over and over again. Rather, Bjorke and Holopainen (ibid) argue that these patterns can help designers to understand solutions to some design challenges to use them in combination with newly designed specifications. Therefore in this phase, some of these patterns are reviewed and it is explored how these patterns can be combined to achieve the desired design of the game.

2.4.6. Development Phase

In this phase the outcome of the previous phase is used to develop a playable game. This playable version of the game does not need to have all the specifications of the game, but it should be close enough to what is defined in previous phases so that in the piloting phase it helps the designer to better understand the users experience. Given the limitations of this research, the main criteria for choosing the most suitable programming language are the ease of learning and application and the time required for the development phase. In this sense, rather than choosing the latest libraries and trends in designing user interfaces and websites, systems are chosen that have a robust base and easily accessible documentations on their development and use. At the end of this phase, a playable version of the game is therefore ready to be tested in the evaluation phase. The detail explanation of the development process is provided in section 5.7 of chapter 5.

2.4.7. Evaluation Phase

Over the past decades, an increasing amount of research interest has been directed towards evaluating digital games. The evaluation of games was a largely informal process in the past (Schlenker & Bonoma, 1978); focusing on the standard metrics such as effectiveness in task completion or efficiency in
error rate (Song & Lee, 2007). Despite the usefulness of such measures for evaluating usability of traditional games, these standards are not directly applicable to all aspects of digital games (Pagulayan, Keeker, Wixon, Romero, & Fuller, 2002). As a result, in the past decades the gaming scholars have started to adopt more formal evaluation techniques from software design and human-computer interaction (HCI). Efforts are mainly focused on considering the manner in which definition of usability differs between digital games, traditional software and serious games. Usability is a concept that is often used in the software development field and it includes three measures: effectiveness (accuracy and completeness of users achieving set goals), efficiency (the resources expended to complete goals), and satisfaction (the users’ attitude).

Many scholars have attempted to tailor usability measures to games by defining the ‘playability’ concept; for a game to be usable it should be playable. This highlights the importance of focusing on the concept of the play and understanding the differences between usability of a software and playability of a game. Reviewing existing literature on the differences between usability of software and playability of a game, Sanchez et al. (2009) have summarized the differences as shown in table 2-1. In software development the emphasis is put on making the software easy to understand and simple while in game design adding more and more challenges to the game is one of the main features that increases the playability of the game. Järvinen et al. (2002, p. 17) establish a definition of playability for both design and evaluation: “a collection of criteria with which to evaluate a product’s gameplay or interaction”.

<table>
<thead>
<tr>
<th>UX Usability Goals: productivity</th>
<th>PX playability Goals: Entertainment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Task completion</td>
<td>1. Entertainment</td>
</tr>
<tr>
<td>2. Eliminate errors</td>
<td>2. Fun to beat obstacles</td>
</tr>
<tr>
<td>3. External reward</td>
<td>3. Intrinsic reward</td>
</tr>
<tr>
<td>4. outcome-based rewards</td>
<td>4. Process is its own reward</td>
</tr>
<tr>
<td>5. Intuitive</td>
<td>5. New things to learn</td>
</tr>
<tr>
<td>6. Reduce workload</td>
<td>6. Increase workload</td>
</tr>
<tr>
<td>7. Assumes technology needs to be humanized</td>
<td>7. Assumes humans need to be challenged</td>
</tr>
</tbody>
</table>

Source: Sanchez et al. (2009)

The different usability issues in digital games have been identified by Clanton (1998) as being the game interface, game play, and the game mechanics.
Game interface refers to all the devices that the players come into contact with during the game; game play comprises the processes which are defined for players through which they achieve the goal of the game and game mechanics signifies the rules, scoring system and physics of the game. Several scholars have expanded the Clanton’s model to make it more suitable for evaluating new genres of the game such as massive multi player online games and social network gaming.

Reviewing the approaches and frameworks on digital game evaluation, Song and Lee (2007) illustrate the aspects of usability evaluation of computer games as shown in figure 2-6 which also includes “the tasks that gamers must or desire to accomplish, and the narratives that yield fun, enjoyment, and curiosity” (Song & Lee, 2007, p. 711). In the case of serious gaming, a further extension is needed to include the concerns regarding the serious aspects of the game (Gee, 2003; Mayer et al., 2014; Michael & Chen, 2005). Despite the efforts in mainstream game design for devising playability frameworks, the usability aspects and emphasis on productivity of the software are still very central to evaluation frameworks for serious games. As discussed in chapter 3, section 3.4, the main focus in serious gaming is the productivity of the game and reaching the desired outcomes and therefore task completion is highlighted more than entertainment effects of playing the game. In this sense, despite acknowledging the aspects of the playability concept, the evaluation frameworks which are used in serious gaming mainly make use of usability frameworks.

In both usability and playability frameworks the methodological approaches can be put into two broad categories; user-based evaluation and heuristic evaluation. The latter was proposed by Neilsen & Molich (1990) to test the usability of software applications. In this method, usability experts go through the software to unravel problems that the user might face throughout the game. Given the predictive nature of this approach, the problems identified are not necessarily identical with the ones that users might face in the actual use of the game. And the former is mainly done through user participation and playtesting. Surveys (Davis, Steury, & Pagulayan, 2005), focus groups and beta testing are the most commonly used techniques for user-based evaluations.
The surveys are usually used to ask the game players about the features that are liked or disliked after the release of the game. Despite their widespread use in game evaluations, they have a number of limitations; the sample for the survey must be big enough to have statistically significant comparisons and analysis and the formulation of questions for evaluating user experience is not very easy in the case of user experience evaluations. Scholars (Someren, Barnard, & Sandberg, 1994; Song & Lee, 2007) point out that “It is difficult to ensure that survey responses are unbiased as respondents base their perceptions on long-time game interactions that serve to distort their long-term memory and allow for re-interpretation”. Focus groups have been used by designers and researchers in different stages of the design. Some designers use focus groups in the very early stages of design for concept generation. Such focus groups mainly include storyboards and story maps. The focus groups are used in combination with participant observation techniques to understand how players interact with the game when the game is released. The other method is beta testing which is mainly used for understanding system bugs and the player’s response to the game. In the heuristic approaches to game evaluation however a number of criteria are used to evaluate the gameplay, story and the mechanics of the game. This approach is mainly focused on evaluating the game as a system on its own.

While in many studies the evaluation framework is designed focusing only on one of these approaches, Nacke (2009) argues that different aspects of the game require different approaches to evaluation. He proposes a hierarchical game usability model which takes into account the concrete (practical) to abstract (theoretical) elements of the game. He argues that quality assurance and the system quality can be achieved through using the set of industry
standards and bug tracking while user experience analysis can make use of user-based approaches.

Following Nacke’s (ibid) framework in this project a workshop was held for group testing at the University of Manchester (Figure 2-7). Every playtester was provided with a computer on which s/he could play the game. Playtesters were given one hour to play the game. Afterwards a presentation was given to the group on the main aim and objectives of the game. This was to test whether the level of abstractions in the game is picked correctly. Finally the group were asked to fill in a feedback form. In this form apart from regular questions which investigate and evaluate the user experience, certain questions were also included to gather information about the habits of the playtester and their gaming knowledge. Participant observation techniques were used during the workshop to evaluate how the playtesters interacted with the game, what technical problems they faced, how long it took them to complete a mission and how easy it was for them to follow the instructions in the course of playtesting.
After the workshop and the initial result of the playtesting, semi-structured interviews were done with three planners who were present in the workshop and two game designers, one from the Larks game design group in Manchester and one independent game designer to evaluate the design of the game and the possible solutions. The detailed process and outcomes of the playtesting session are provided in section 6.3 of chapter six.

### 2.5. Summary of Research Methods and Questions

The research questions and the methods that were used to answer them are summarized in table 2-3. The research was done in three main phases; the rigor, the relevance and the design. The rigor phase, (which addresses objective one), aims at understanding games as a medium. This was done through reviewing existing literature on game studies, serious gaming and gamification. The relevance phase (which addresses objective two) is mainly focused on understanding the current and the potential uses of digital games in urban planning context. This was achieved through reviewing the existing literature on the complex nature of decision making processes in the participatory planning context. Having the outcomes of the rigor and the relevance phase, the design problem was defined by mapping the driving forces behind the existing gaps in the use of games using ‘Current Reality Tree’ (CRT) technique (Figure 5-3). In an iterative process, the user-centric design approach, narrative immersion and world building concepts were used to conceptualize potential solutions to the gaps that were identified. To make sure that the specific context of participatory planning is reflected in the design, a number of game principles were introduced. At the end of this phase a playable version of the game was developed and tested by two game designers (using heuristic approach). To make sure that the design fits the needs of its potential us-

<table>
<thead>
<tr>
<th>Usability Test</th>
<th>Player’s Perspective</th>
<th>Planners and Game designer’s Perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workshop/Participant Obser-</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>vation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Questionnaire</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Semi-structured interview</td>
<td>-</td>
<td>X</td>
</tr>
</tbody>
</table>

Table 2-2: Methods for Playtesting
ers, a playtesting session was organized with the public and two game designers and three planners were interviewed.

Table 2-3: Summary of Research Questions and Methods

<table>
<thead>
<tr>
<th>Phase</th>
<th>Objective</th>
<th>Research question</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIGOR PHASE</td>
<td>ONE</td>
<td>How are games conceptualized and defined in mainstream game design and serious game design literature?</td>
<td>Literature Review</td>
</tr>
<tr>
<td></td>
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<td>What sorts of knowledge can games generate or use?</td>
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<td>What are the unique qualities of digital games compared to other existing ‘New Media’?</td>
<td>Literature Review</td>
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<tr>
<td>RELEVANCE PHASE</td>
<td>TWO</td>
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<td>What are the perceived values of expert and lay knowledge in participatory planning practices?</td>
<td>Literature Review</td>
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<td>What are the current uses of games in planning practices?</td>
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<td>Literature Review</td>
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<td>Literature Review</td>
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<td>How can the in-between space of imaginary world of games and real world of planning be dealt with in the design to ensure an effective design?</td>
<td>Literature Review</td>
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<td>Literature Review</td>
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<td>AND DEVELOP</td>
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<tr>
<td>What genre of game, technology and game mechanics are needed for a game to provide the planners with the knowledge they need?</td>
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<td>What development framework can be used to ensure the efficiency and effectiveness of the design?</td>
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<td>Rapid Proto-typing</td>
</tr>
<tr>
<td>What playability and usability measures can be used to evaluate the designed game?</td>
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<td></td>
<td>Literature Re-view</td>
</tr>
<tr>
<td>What is the perceived usefulness of games from the planner's point of view?</td>
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<td>Questionnaire/Interview</td>
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<tr>
<td>What aspects of the proposed designed have failed and how they can be fixed?</td>
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<td>Participant Observation</td>
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<tr>
<td>What lessons can planners learn from the game design processes and concepts?</td>
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<td>Interview</td>
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</tbody>
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Chapter 3

GAME SCIENCE AND URBAN PLANNING

3.1. Introduction

This chapter seeks to examine the emerging role of games in urban planning processes by unravelling the capacities of digital games as a medium and their historic role in scientific fields. The chapter begins with a review of existing approaches in urban planning to the concept of games for purposes other than pure entertainment. It explains how the emergence of game science has made games potential tools for urban planning tasks since the 1960s. The chapter critically discusses the limitations and potentials of games as a medium. It focuses on explaining how games deal with data flow between the real world and the imaginary world of games. The chapter is then concluded by conceptualizing computer games as an artefact with embedded information systems and outlining the possible ways in which games can be used in planning practices.

3.2. When Games Met Science; the Historic Use of Games in Planning Practices

The very root of game science can be found in ancient war games (Mayer, 2009). Games were historically used for creating simulated interaction environments for exploration, planning, testing and training of military opera-
tions (Brewer & Shubik, 1979; Klabbers, 2009; Mayer, 2009). In the 1940s and 1950s, particularly after World War II, war gaming was transferred to simulation gaming as a rational and analytical method of public policy making (Mayer, 2009). The work of Morgenstern and Neumann (1944) on the "Theory of Games and Economic Behaviour", emergence of decision sciences (i.e. operational research) and the wide range of studies done by the RAND corporation (Brewer, 1972, 1975; Goldhamer & Speier, 1959) were very influential on the then emerging discipline of 'Gaming and Simulation' for public policy making (Fischer & Miller, 2006; Mayer, 2009). In the 1970s, scholars such as Richard Meier, Dick Duke and Allan Feldt, "founding fathers of urban gaming" (Mayer, 2009, p. 832), showed interest in using simulation gaming as policy analytic methods in the urban planning context. In addition, with the accelerating pace of urban developments after World War II and the rising interest in urban matters, cities and planning concerns became the topic of many main stream commercial games (such as SimCity). Given that the works of scholars in this era are still being used as the main references in this strand of studies (Klabbers, 2009), it is insightful to review how the use of games in planning context has evolved since the 1970s.

3.2.1. Simulations, Serious Games and Policy Games

In 1970 a group of game designers got together in the first International Conference on Simulation and Gaming (Klabbers, 2009) which was later marked as the start of ‘Simulation and Gaming’ as a discipline. The main topic at hand in this gathering was the use of games in the urban planning context. The choice of urban planning did not come as a surprise; in 1960s urban simulation models had gained momentum and by the late 1960s arguments (Lee, 1973) were raised on the limitations of large-scale models in dealing with social complexities. To better understand and deal with complexity and uncertainty, the use of gaming, interactive simulation and computer simulations were then called for as Klabbers (2009, p. 448) puts it:

"Simulation models enabled expressing complex dynamic systems in tangible ways, and they allowed for performing experiments without interfering with "real-life" reference systems. In addition, linking human players to such models – that is, framing a gaming and learning environment - could enhance the transmission of available knowledge"
and the discovery of new ways to explain characteristics of system’s behaviour.”

This conference and its outcomes left their mark on the way games were and are being used in contexts other than pure entertainment in general and in the urban planning field in particular. The use of games for pedagogic and communication purposes in serious contexts was already tried-and-tested case. Several games were designed in the US and the UK planning institutes with varying focuses and spatial scales for educational purposes as early as 1958 (Mayer, 2009; Taylor, 1971). However the use of games for research purposes was not yet explored to that date and therefore it raised many arguments at the conference of 1970, as Klabbers (2009) reports the matter left unsolved. As the final decision members suggested “labelling the [use of games for] pedagogic objectives as gaming and the [use of games for] research objectives as simulation” (Klabbers, 2009, p. 450). The idea was that contrary to the games that are solely designed for entertainment purposes, games for policy making need to be based on “scientifically valid and policy-relevant theories that could be developed or tested” (Mayer, 2009, p. 831). This formulation of games was then used as a foundation for future practices. In the same year, Clark Abt (1970), one of the main organizers of that conference, suggested the term ‘serious game’ for talking about games that “have an explicit and carefully thought-out educational purpose and are not intended to be played primarily for amusement” (Abt, 1970, p. 9). Building on the findings of this conference, Duke (1974, 1980; Duke & Geurts, 2004), Meier (Meier & Duke, 1966) and Feldt (Feldt, 1972, 1995) published extensively on the ways simulation games can be used in urban planning contexts. Despite their efforts, reports started emerging criticizing the “weak scientific foundations of gaming” (Mayer, 2009, p. 830) on the one hand and the epistemological and practical limitations of modelling and simulation on the other (D. Lee, 1994).

While the use of simulation games started to decline (Cecchini & Rizzi, 2001) by the end of 1980s, the worldwide success of video games and their social impact provided planners with new insights on the ways games could be used in planning processes (Mayer, 2009). At the start of the 21st century, given the dominance of communicative rationality and the advances in the mainstream game design, new attributes such as interactivity, persuasiveness, subjectivity and engagement were associated with computer games (Perron & Wolf, 2009). The main stream game designers started to criticize the dominance of simulation games. In 1997, Parson noted:
“The distinction between games for amusement may become increasingly blurred by advances in computer modelling power, however, which permit the development of simulations and games that are ambiguous in both their degree of representational fidelity and their intent” (Parson, 1997, p. 274).

It was in this context that to make the dialogue possible between the mainstream game designers and policy game designers and to strengthen the scientific foundation of games, the formal study of games was called for. In 2001 gaming managed to establish its foundation as a field in its own right to unify the works that scholars from different disciplines were doing about games and playful activities (Frasca, 1999). The first issue of a peer-reviewed journal of computer gaming was published and the first academic conference focusing specifically on computer games was held (Calleja, 2007).

3.2.2. Storytelling Paradigm and Gamification: the Second Wave of Interest in the Use of Games in Planning

At the start of the 21st century, highlighting the interactivity and persuasiveness of computer games, new kinds of games such as Social Network Games (SNG) and Massive Multi-Player Online Games (MMOG) emerged. On the one hand the success of these games in engaging large number of players and on the other hand the then-rising popularity of the storytelling paradigm (built on the narrative rationality introduced by Fischer (1985)) in participatory planning made computer games and online games potential tools for overcoming the limitations of the participatory planning practices.

James Throgmorton was one of the first scholars who conceptualized planning as “persuasive and constitutive storytelling about the future” (Throgmorton, 1996, p. 46). Later Forester (1993) and Sandercock (2003) tried to reflect the theoretical ideas of Throgmorton in the practice of planning. The different approaches to storytelling in planning are summarized in Figure 3-1. Throgmorton (2003) believes that story and storytelling is an “extremely important but largely undervalued part of planning” (Throgmorton, 2003, p. 126). By defining elements of story, he tried to define the planning process and its component as a process of storytelling about the future of cities. Barbara Eckstein (2003) on the other hand paid more attention to the real practice of planning as a persuasive storytelling. She defined stories as
“verbal expressions that narrate the unfolding of events over some passage of time and some particular location” (Eckstein, 2003: 14). According to her any story needs framing; limiting itself to a set of characters at a specific time and location hence exclusion is inevitable in storytelling. Sandercock (2003) argues that stories are used “to imagine the ultimately unrepresentable space, life and languages of the city and to make them legible” (Sandercock, 2003: 12). In this sense stories can have different meanings, being anecdote, exemplar and something invented and not new. According to her all the three meanings can be applicable to a planning context.

Forester’s work in the storytelling field is more focused on individual stories and the use of storytelling for dealing with differences and reconciliation of deep conflicts. Forester (1993:195) defines the role of stories in planning as follows:

“... Stories do particular kinds of work: descriptive work of reportage; moral work of constructing character and reputation (of oneself and others); political work of identifying friends and foes, interests and needs, and the play of power in support and opposition; and, most important [...], deliberative work of considering ends and means, values and options, what is relevant and significant, what is possible and what matters, all together.”

Such a definition of the story considers stories more as a tool for planning than a core element of the planning practice. He concludes that planners are ‘reflective practitioners’ who learn through stories they hear in the real world and react to them in their work, and they are ‘deliberative practitioners’ who learn through interacting with each other in planning meetings. He believes that planners do not simply express their ideas through plans, they selectively reconstruct the problems and prioritize them and it is here that the stories come to planning. To be able to prioritize and identify the problems, planners need to hear stories not only from the community but also from other planners.

Despite the fact that various conceptions of stories could lead to the development of new tools with stories in their core, the storytelling paradigm could not succeed in achieving its goals; for example in the case of the use of stories as participation tool it was not clear for the public and the planners
how the collected stories can be incorporated into planning decisions (Sandercock 2010). However, the discussions on the role of stories and storytelling in the practice of planning, highlighted the importance of acknowledging those kinds of knowledge which had not traditionally been taken for granted in the theory and practice of planning and consequently opened opportunities for planners to explore potentials of new media and tools.

The introduction of narrative rationality gave momentum to mediums such as digital games, cinematography and videos that have narrative in their core (Sandercock 2010). In 2004 the Games for Change (G4C) initiative was launched which was specialized in using games for social impact. In 2005, however, Bunchball was established as the first company to offer a platform for organizations to create a gamified process. Unlike G4C which was mainly focused on creating video games with a strong social message in their core, Bunchball used pre-made elements such as points, leaderboards and badges. The idea that was later expanded as the use of game elements to motivate people to change behaviours or develop skills, or to drive innovation and became known as Gamification; the term that was first coined by Nick Pelling in 2002 to describe his work as a consultant for making hardware more fun (Dale, 2014). Gamification nowadays has become an umbrella term for referring to various applications of games and game-like systems in non-gaming contexts. Gamification experts however emphasize in their publications that gamification does not aim at creating games. Rather, it is about creating systems which make use of game elements such as points, competition, leaderboard, and badges to motivate the user to change behaviour or develop skills.
3.3. The Current Use of Games in Participatory Planning Practices

Despite the centrality of serious games in the key literatures on games in planning, the link between planning and games is not just limited to their scientific use; several successful commercial games are designed with cities and spatial qualities of living environments as their core theme. The qualities of these commercial games are largely undervalued. Therefore to better understand the current link between games and planning practices, it is crucial to include these games in the review of games in planning as well. In the following sections, to better understand the current role of games in planning processes, the existing games are discussed in three categories; games about planning, games for planning and games that use the city as their playground.

3.3.1. Games about Planning

The first group, games about planning, covers games that directly or indirectly tackle those aspects of people’s life world which are of interest to planning; games about citizenship, communities, urban economy, taxes, public spaces and so on. These games are not designed to have specific outputs which can be used in planning decision making processes; they are inherently commercial games, for a large number of audiences and their function is mainly entertainment and communication of ideas. The games about planning are mainly concerned about providing a good quality user experience and connecting with as many audiences as possible.

The history of these games is as old as civilization. Many of the ancient games in this category are now studied by historians and sociologists as sources of information about the nature of life-world in the ancient civilizations (Toohey & Veal, 2007; Van Binsbergen, 1997). Chess can be considered as one of the most famous examples of such games (Pagnotti & Russell, 2012; Roberts, Arth, & Bush, 1959); When created, Chess was an abstraction of the unique life-world of the medieval era; it represents different classes of society, their role, their power represented in their unique spatial movements and initial arrangements of the pieces. With the increasing complexity of human life-worlds, the subject of these games also became more elaborate. In the late 19th century many board games were designed to illustrate social classes, labour conditions and human rights within the cities.
<table>
<thead>
<tr>
<th>GAME</th>
<th>PURPOSE</th>
<th>Description</th>
<th>TECHNOLOGY</th>
<th>DEVELOPER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monopoly</td>
<td>Entertainment, pedagogy</td>
<td>Educating the economic ideas of Henry George Taxation system in the cities the</td>
<td>Board Game</td>
<td>Parker Brothers</td>
</tr>
<tr>
<td>District messenger boy</td>
<td>Entertainment, Communication</td>
<td>Reflecting the life of District Messenger Boys in 1896. The game reflects on the child labour, the organizational limitations and mechanism of success in big corporations</td>
<td>Board Game</td>
<td>McLoughlin Brothers</td>
</tr>
<tr>
<td>Urban Renewal</td>
<td>Entertainment, Communication, Pedagogy</td>
<td>It is a role playing game about the urban renewal process. Each player assumes a role, varying from City Councillor and Developer to Man-On-The-Street and Skyscraper Enthusiast. The game is an open ended game and the actions of the player are limited.</td>
<td>Board Game</td>
<td>Flavio Trevisan</td>
</tr>
<tr>
<td>SimCity</td>
<td>Entertainment, Communication, Pedagogy</td>
<td>The game is a very detailed simulation game in which the player can found a city, take care and maintain it in the framework of the given budget available for a variety of activities.</td>
<td>Computer Game</td>
<td>Will Wright</td>
</tr>
<tr>
<td>Urban Sprawl</td>
<td>Entertainment, Communication</td>
<td>It abstractly models the growth of a town into a thriving city into a teeming metropolis. Players act as entrepreneurs, tycoons, and politicians, working to develop a single modern urban area. SuperCity 3 is an online flash game. In this game predefined cities are used with inactive land uses. The plots and design of the city and the land uses are not changeable by the player. The player has the choice of buying land uses to make them active. The game starts in year 1930, and over the course of the 120 year game span, the player can potentially link every town and industry to another via the various types of transport. The ultimate aim of Transport Tycoon is to reach the year 2050 and achieve the title of &quot;Tycoon of the Century&quot;</td>
<td>Board game</td>
<td>Chad Jensen</td>
</tr>
<tr>
<td>Super City 3</td>
<td>Entertainment, Communication</td>
<td></td>
<td>Online Game</td>
<td>Girdf</td>
</tr>
<tr>
<td>Transport Tycoon</td>
<td>Entertainment, Communication, Pedagogy</td>
<td></td>
<td>Computer Game</td>
<td>Chris Sawyer</td>
</tr>
</tbody>
</table>
The Game of District Messenger Boy built in 1885 which was mainly about the role of the messenger boys as low-paid labours in the big telegram messenger companies is a perfect abstraction of information networks in cities (Matters & Center, 1999). Monopoly, the famous board game, is another example of such games. The first version of Monopoly, called The Landlord’s Game, was designed in 1903 to explain the economic ideas of Henry George and to raise awareness about the implications of these ideas for the taz system (Parlett, 1999). Later in 1935 the commercial version of it was released in US with the same idea at its core. In the 1960s, considering the increasing popularity of cities and urban simulations and models, the creation of the new virtual cities, societies and territories continued to grow in popularity. The first version of SimCity was designed by Will Wright in 1989 based on the then-dominant simulation and gaming ideas (Lauwaert, 2007). Since then a plethora of games have been designed using the same ideas and the big success of this type of games led to emergence of a new genre of games commonly known as the “city builder” genre; These commercial open ended games provided the player with full control over the simulated world (Wood & Landry, 2008). Despite the fact that these games were mainly designed as commercial games, the widespread success of some of them (such as SimCity and Monopoly) turned them into great pedagogic tools; SimCity for example is used in urban planning classrooms to teach complex planning issues (Bereitschaft, 2015; Gaber, 2007). A number of successful cases of games in this category are reviewed in table 3-1.

3.3.2. Games for Planning Issues

The second group of games is games for planning issues/processes. This group covers the games that are known as 'serious games'; games that have a well-defined problem at hand and are not designed purely for entertainment purposes. As discussed earlier, the origin of these games can be sought in the simulation gaming tradition. These games nowadays are mainly used in participatory planning practices either to educate the players about different aspects of the city and the role of different stakeholders which are involved in the process (see for example Play the City game) or to enable the players to express their opinion within a participatory setting (see for example China-Town and B3 games). Various technologies have been used to create these
<table>
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<tr>
<th>GAME</th>
<th>PURPOSE</th>
<th>Description</th>
<th>TECHNOLOGY</th>
<th>DEVELOPER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Play the City</td>
<td>Communication</td>
<td>This game is a board game that the plot is the physical 3D model of the planning area. Players can have different roles being residents, politicians, developers, constructors, investors, activists and architectures. It is a 3-D immersive game designed to be part of the master planning process for Boston’s Chinatown. The player choose the role of one of 15 virtual residents and work to complete the assigned quest – finding a job, housing, or place to socialize. The player will then be tasked with considering the future of the neighbourhood by walking through and commenting on proposed development sites.</td>
<td>Board Game</td>
<td>play the city foundation</td>
</tr>
<tr>
<td>Participatory ChinaTown</td>
<td>Communication</td>
<td>SimLandscape has been developed to be used in process of planning for the new airport for the Twente region in the Netherlands Within Simlandscape, areas are considered a patchwork of delivered projects. These areas (projects) are identified as the result of the combination of administrative visions and rules, and of the design, development and management of lots by their respective owners. It is a simulation game which focuses on a specific area in Hamburg. The players can view the current situation on the marketplace in a 2D and 3D visualisation of the marketplace, and design their own marketplace, adding different spatial elements such as benches, trees, lights, etc. They can get involved into a chat with other citizens discussing the visions of further development of the marketplace, or with urban planners asking for their professional view about possible further developments of this district</td>
<td>Computer game</td>
<td>ACDC/Emerson College</td>
</tr>
<tr>
<td>SimLandscape</td>
<td>Communication</td>
<td></td>
<td>Computer game</td>
<td>University of Eindhoven</td>
</tr>
<tr>
<td>B3</td>
<td>Communication</td>
<td>B3 is a simulation game which focuses on a specific area in Hamburg. The players can view the current situation on the marketplace in a 2D and 3D visualisation of the marketplace, and design their own marketplace, adding different spatial elements such as benches, trees, lights, etc. They can get involved into a chat with other citizens discussing the visions of further development of the marketplace, or with urban planners asking for their professional view about possible further developments of this district.</td>
<td>Computer Game</td>
<td>University of Hamburg</td>
</tr>
<tr>
<td>Urban Future</td>
<td>Entertainment</td>
<td>Urban Future is a board game which highlights the benefits of working with the local community to create a clear vision for an area to successfully tackle long-term urban change and it is used within the focus groups and community consultation processes.</td>
<td>Board game</td>
<td>Ian Cooper</td>
</tr>
</tbody>
</table>
games; board games are used as a supplementary tool in community focus groups or in other cases like ChinaTown, a detailed web-based simulation of the city is created for the player so that the player can navigate through the simulated city to explore different places.

Two distinct subcategories can be defined in this category; serious games which are used for communication and pedagogy purposes and the ones that are used for research purposes. Games like China Town and B3 which are designed for research purposes, i.e. for generating knowledge and collecting data which can be used in decision making process mainly follow the simulation and gaming tradition. The game world is an accurate simulation of the real world and the focus is more for the game to be theoretically and scientifically valid rather than providing a good user experience. Furthermore, the games that are used for educating the players about the complex nature of planning and the role of different stakeholders in the process are mainly designed as board games which can be played as part of the community focus groups. The main aim of these games is mainly to create a foundation for the actual consultation which will happen later in the process.

3.3.3. Games that Use the City as a Game Board

Finally, the last group of games are games that use the city as a game board. These games are commonly known as pervasive games:

“They are designed for mobile devices where the physical world becomes the game board and the connected device the interface. These games can take place within the time and space of everyday life, but they are set aside from everyday life through either a logically consistent rule structure or make-believe” (Gordon, 2009, p. 31).

Through using mobile technologies, these games have enabled game designers to expand the magic circle temporally, spatially and socially (Montola, 2005). While ‘geocoaching’, also known as a ‘scavenger hunt’ or ‘treasure hunt’ games, is the most well-known type of pervasive games, with the technological advances mixed reality and virtual reality pervasive games are being developed (Hinske, Lampe, Magerkurth, & Röcker, 2007). In the past decade, theatre has contributed greatly to the development of new types of
<table>
<thead>
<tr>
<th>GAME</th>
<th>PURPOSE</th>
<th>Description</th>
<th>TECHNOLOGY</th>
<th>DEVELOPER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grand Theft Auto</td>
<td>Entertainment</td>
<td>GTA is an adventure action game which is built in several cities. The Gameplay focuses on an open world where the player can choose missions to progress an overall story, as well as engaging in side activities. The series is very famous for its truthful detail simulation of the cities.</td>
<td>Video Game</td>
<td>David Jones</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Mike Dailly</td>
</tr>
<tr>
<td>Ingress</td>
<td>Entertainment</td>
<td>Is a massively multiplayer location-based game. The gameplay consists of capturing &quot;portals&quot; at places of cultural significance, such as public art, landmarks, monuments, etc., and linking them to create virtual triangular &quot;control fields&quot; over geographical areas. Progress in the game is measured by the number of &quot;mind units&quot; (MUs) captured via such control.</td>
<td>Pervasive Game</td>
<td>Niantic, Inc.</td>
</tr>
<tr>
<td>LOCUNET</td>
<td>Communication Research</td>
<td>Users navigate the play area; certain digital objects appear on their screen depending on the user's actual geographic location. The goal of the game is to win points by collecting objects. To win points, players must collaborate with other players to bring an object to the headquarter.</td>
<td>Pervasive Game</td>
<td>University of Eindhoven</td>
</tr>
<tr>
<td>CitySneak</td>
<td>Communication</td>
<td>It explores the issues of surveillance in the urban spaces. Using GPS-equipped cell phones or PDAs, players of CitySneak are informed of the fixed surveillance cameras in the designated urban space. Players navigate through the space, attempting to go from a predetermined start point to an end point without coming into close contact with the camera. If players move within the designated fields of camera visibility, their phone notifies them that they have been seen and that the game is over.</td>
<td>Pervasive Game</td>
<td>University of Hamburg</td>
</tr>
<tr>
<td>Can you see me now?</td>
<td>Entertainment</td>
<td>A mobile mixed reality game in which up to twenty online players were chased across a map of a city by three performers who were running through its streets.</td>
<td>Pervasive Game</td>
<td>Blast Theory</td>
</tr>
</tbody>
</table>
pervasive games with much elaborated storyline and enhanced user experience. These games have revolutionized how individuals interact and understand locations and they have enabled players to personalize and control their experiences in urban spaces (De Souza e Silva & Frith, 2013). Moreover they are essentially social activities which are either built on already existing located information or they aim at producing such types of information. Therefore there is assumed a lot of potentials for them to be used as tools for collecting or creating located information (Matyas et al., 2008). To this date most of the location based games in planning (see for example ZWERM) are designed to create a sense of community and to make their players familiar with the play environment. Although these games have not been used for research purposes, a big potential is seen in these games to be used as participatory research tools in planning processes. The emergence of pervasive games which aimed to collect spatial data is opening new insights on the ways qualitative spatial data can be gathered. City Explorer is one of the examples of such games. In this game “players take geo-referenced photos, localize geographic points of interest and categorize them semantically” (Matyas et al., 2009). The design of this game is inspired by the successful board game called Carcassonne which was originally designed by Klaus-Jurgen Wrede in 2000. A number of successful examples of games in this category are listed in table 3-3.

<table>
<thead>
<tr>
<th>Game Category</th>
<th>Aim</th>
<th>Association with a dominant trend</th>
<th>Success Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Games about planning</td>
<td>Entertainment/Pedagogy and Communication</td>
<td>Main stream game design</td>
<td>Number of sells/audience</td>
</tr>
<tr>
<td>Games for planning</td>
<td>Pedagogy and Communication /Increased sense of community</td>
<td>Storytelling Paradigm</td>
<td>Increased civic participations</td>
</tr>
<tr>
<td></td>
<td>Research/collecting data</td>
<td>Simulation and Gaming</td>
<td>The usefulness and validity of the gathered data</td>
</tr>
<tr>
<td>Games in the city</td>
<td>Entertainment/Pedagogy and Communication</td>
<td>Main stream game design</td>
<td>Number of Participants</td>
</tr>
</tbody>
</table>
3.3.4. Gamification and Gameful Design

Over the past decade there has been a growing interest in the use of gamification and playful design in participatory planning. The incorporation of gamification and gameful design principles into participatory planning practices have led to emergence of a wide variety of innovative approaches to engaging the public with planning processes. Two main goals are pursued by advocates of these approaches: 1) making the cities more livable through increasing gamefulness in urban spaces and 2) understanding and collecting data about people's behaviours or ideas in a playful way.

According to advocates of playful city "a city that allows for play and perhaps even encourages a gaming frame of mind is a human city—a city that is tolerant and flexible enough to let inhabitants pursue their dreams and desires, in public if they wish ... a city that is livable in the full sense of the word—beyond good public transport, ample green space, and cultural activities" (Alfrink, 2015, p.527). Therefore the ‘gamefulness’ can be considered as an additional criterion for measuring the city's livability. The projects that follow this ideology (such as Hello lamppost and Pieces of Berlin (Burke and Maharas, 2011)) try to raise awareness about the social and urban issues through changing the way people interact with their surrounding physical environment.

In another strand of study, gameful design and gamification techniques are used to design systems which are used for collecting data about the public’s behaviours in urban spaces. These attempts (such as Commons (O'brien 2016), and Chromaroma (Toprak et al. 2012)) are intersections of Gamification and Citizen Science trends (Cooper 2015); providing playful means for the public to contribute to scientific research. One of the early examples of using a gamified system as a mean for facilitating citizen's contribution to science was EPS game developed by Luis von Ahn which later was incorporated into Google Image Labeler (Palazzi et al. 2010). In this online game two people with no way to communicate were simultaneously given an image and were asked to assign a label to it. The players were given points if they have matching label for each picture. The assigned labels were afterward used in developing Google Image Search. Given that the focus of this study is on games, the works in this category are not further analysed however a number of successful cases of such systems are summarized in table 3-5.
<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>PURPOSE</th>
<th>Description</th>
<th>TECHNOLOGY</th>
<th>DEVELOPER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commons</td>
<td>Entertainment, Collecting data</td>
<td>It is designed for citizen stewardship in urban environments that make citizen reporting their problems more playful. During the game the player has to report via the game a problem to fix or a suggestion for improvement along with reporting nearest intersection and a geo-tagged photo. Players earn experience points for their City Report.</td>
<td>Mobile</td>
<td>Suzanne Kirkpatrick</td>
</tr>
<tr>
<td>Chromaroma</td>
<td>Entertainment, Communication</td>
<td>It’s a game that also supports the goals of Transport for London, rewarding players for travelling better by encouraging non-rush hour travel, getting off early and walking, or riding bikes instead of travelling on buses and trains. It was designed for the neighbourhood of Hoogerven in Utrecht. The gamified system was a photo safari game which ran over the course of three weeks. The aim is to encourage the users to take as many photos as possible of oneself with someone else including scenery from the neighbourhood.</td>
<td>Mobile</td>
<td>Mudlark</td>
</tr>
<tr>
<td>Koppelkiek</td>
<td>Entertainment, Communication</td>
<td>It is an interactive system that by referencing the thousands of pre-existing identifier codes that label items of street furniture across the whole city, players can send text messages to particular objects, including (but not limited to) lamp posts, post boxes, bollards, manholes, bins, or telegraph poles.</td>
<td>Pervasive</td>
<td>Hubbub</td>
</tr>
<tr>
<td>Hello Lamppost</td>
<td>Entertainment</td>
<td>Is designed to explore the relationship between personal memories and real world objects (things). Tales of Things is a tagging service that uses two-dimensional barcodes (QR Codes) and RFID tags to enable people to attach stories and memories to any object. The scanning of readable and writable tags allows stories to be replayed and added.</td>
<td>Mobile</td>
<td>PAN Studio, Tom Armitage and Gyorgyi Galik</td>
</tr>
<tr>
<td>Tale of Things</td>
<td>Entertainment, Collecting data</td>
<td></td>
<td>Mobile, QR codes, RFID</td>
<td>The PETRAS Internet of Things Research Hub</td>
</tr>
</tbody>
</table>
3.4. Game, Simulation or Interactive System; On the Terminological Ambiguity and Evolving Definition of Games

Before analysing how games are being used in planning practices, it is important to understand how the term ‘game’ is used in different studies. Game seems to be an umbrella term covering many different concepts. Therefore to better situate games within planning practices, it is crucial to understand what games are and how they can be distinguished from a simulation, an interactive system or other media.

Achieving the real definition of games has been of the most challenging and controversial tasks for gaming scholars. Since the start of game studies as a field in its own right, defining the main properties of games through defining their ‘sufficient and necessary conditions’ has shown to be very appealing to gaming scholars. To this date, many studies (Abt, 1970; Avedon & Sutton-Smith, 1971; Costikyan, 1994; Crawford, 1981; Juul, 2010; Koster, 2013; Salen & Zimmerman, 2004; Waern, 2012) have used this approach to define games. Works in this group of studies, which are summarized in table 3-5, are normally concluded by providing a list of sufficient and necessary conditions for an entity to be a game. Although many of these works are criticized for their rigid and in some cases very narrow definition of games, they still strongly remain as the main reference of any game related study.

<table>
<thead>
<tr>
<th>Author</th>
<th>Definition of the Game</th>
</tr>
</thead>
<tbody>
<tr>
<td>Johan Huizinga 1964, p.13.</td>
<td>[...] a free activity standing quite consciously outside &quot;ordinary&quot; life as being &quot;not serious&quot;, but at the same time absorbing the player intensely and utterly. It is an activity connected with no material interest, and no profit can be gained by it. It proceeds within its own proper boundaries of time and space according to fixed rules and in an orderly manner. It promotes the formation of social groupings which tend to surround themselves with secrecy and to stress their difference from the common world by disguise or other means.</td>
</tr>
<tr>
<td>Roger Caillois 1961, p.10-11.</td>
<td>[...] an activity which is essentially: Free (voluntary), separate [in time and space], uncertain, unproductive, governed by rules, make-believe.</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Definition</td>
</tr>
<tr>
<td>-----------</td>
<td>------------</td>
</tr>
<tr>
<td>Clark Abt, 1970, p. 6-7</td>
<td>Reduced to its formal essence, a game is an activity among two or more independent decision-makers seeking to achieve their objectives in some limiting context. A more conventional definition would say that a game is a context with rules among adversaries trying to win objectives.</td>
</tr>
<tr>
<td>Bernard Suits 1978, p. 34.</td>
<td>To play a game is to engage in activity directed towards bringing about a specific state of affairs, using only means permitted by rules, where the rules prohibit more efficient in favour of less efficient means, and where such rules are accepted just because they make possible such activity.</td>
</tr>
<tr>
<td>Avedon &amp; Sutton Smith 1981, p.7.</td>
<td>At its most elementary level then we can define game as an exercise of voluntary control systems in which there is an opposition between forces, confined by a procedure and rules in order to produce a disequilibrial outcome.</td>
</tr>
<tr>
<td>Chris Crawford 1981, chapter 2.</td>
<td>I perceive four common factors: representation [&quot;a closed formal system that subjectively represents a subset of reality&quot;], interaction, conflict, and safety [&quot;the results of a game are always less harsh than the situations the game models&quot;].</td>
</tr>
<tr>
<td>David Kelley 1988, p.50.</td>
<td>A game is a form of recreation constituted by a set of rules that specify an object to be attained and the permissible means of attaining it.</td>
</tr>
<tr>
<td>Katie Salen &amp; Eric Zimmerman 2003, p.96.</td>
<td>A game is a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome.</td>
</tr>
<tr>
<td>Jesper Juul, 2003</td>
<td>The game definition has 6 points: 1) Rules: Games are rule-based. 2) Variable, quantifiable outcome: Games have variable, quantifiable outcomes. 3) Value assigned to possible outcomes: That the different potential outcomes of the game are assigned different values, some being positive, some being negative.4) Player effort: That the player invests effort in order to influence the outcome. (I.e. games are challenging.) 5) Player attached to outcome: That the players are attached to the outcomes of the game in the sense that a player will be the winner and &quot;happy&quot; if a positive outcome happens, and loser and &quot;unhappy&quot; if a negative outcome happens. 6) Negotiable consequences: The same game [set of rules] can be played with or without real-life consequences.</td>
</tr>
<tr>
<td>Raph Koster, 2014</td>
<td>&quot;I group sports, board games, and videogames under “game” because all of them are susceptible to being broken down and analysed...&quot;</td>
</tr>
</tbody>
</table>
The very early definitions of game (such as the ones provided by Huizinga and Caillois) were mainly the product of works of scholars in the anthropology and psychology field. In their approach rather than reviewing existing games, these scholars focused on the concept of play. According to them play was the definitive element of any game; in this sense by defining characteristics of a playful activity one could define game (Bernard, 1978; Caillois & Barash, 1961; Huizinga, 1964). Building on the works of scholars of in the 1960s and 1970s, by the late 1980s, scholars started to adopt another approach to defining games known as ‘common core approach’ in which one “looks at previous definitions, find common elements in them, discern problems, and then provides a synthesis that attempts to fix those problems.” (Arjoranta, 2014, p. 1). The well-known and commonly referenced works of Salen, Zimmerman (2003) and Juul (2003) follows this approach.
Salen and Zimmerman (2003) suggested new properties for games to better fit games within the systems thinking framework while Juul (2003) aimed at expanding the so-called classical game model to cover new types of games and to better situate games within other kinds of interactive systems (Figure 2.2). In his study, Juul argues that a good game definition should describe: 1) the kinds of systems set up by the rules of a game (the game); 2) The relationship between the game and the player of the game (the player); 3) The relationship between the playing of the game and the rest of the world (i.e. the attachment of it to reality and the consequences of the game on the real world). The uniqueness of his work was in addressing other types of playful interactive activities in relation to games.

However, following necessary and sufficient condition approach all the game definitions in this category set a very rigid boundary between what is and what is not included in the definition. This is why the game definitions which attempt to list the main properties of games, very often fall short in explaining certain activities which are traditionally perceived as games or will be perceived as games in future. Juul, Salen and Zimmerman’s works were continuously critiqued as being too narrow (Calleja, 2007) while as Arjoranta (2014, p. 1) discusses to define something in general is “to create boundaries for ideas and phenomena so that you can better know what is being discussed. But definitions can also limit you. When you create boundaries, you always leave something outside those boundaries.”

In response to the criticisms on definitive approaches to defining a game and inspired by Wittgensteinian’s family resemblance theory (Wittgenstein, 1967) some scholars (Arjonte, 2014; Koster, 2005) made an effort to devise descriptive frameworks for talking about games. According to Wittgenstein rather than focusing on the essence of a phenomenon and looking for universal definitions of games (as definitive approaches do), one should understand how the use of that phenomenon resemble the context of it. The very immediate and direct use of Wittgenstein’s ideas in game studies is putting games into different categories; i.e. defining families of games. According to advocates of this approach depending on the matter at hand, games can be categorized and discussed based on their technology, platform, strategy, storyline or even the country in which they were produced. Arjoranta (2014) argues that “in this game of defining things, emphasizing different aspects brings some forms of games into a more central position.” In this sense those who argue for
games as narrative highlight the narrativity of games and those who look for more playfulness prioritize free-form play over rule-bounded games. He then argues that “the choice of emphasis usually depends on the reasons for making a certain definition and these reasons may be more interesting or enlightening than the definition itself” (Arjoranta, 2014).

Despite their limitations, both definitive and descriptive approaches are being used in the current studies of games; definitive approaches and in particular the work of Salen and Zimmerman are commonly used in designing serious games and descriptive approaches are mainly used by main stream game designers. Calleja (2007) argues that the difference between advocates of descriptive and definitive frameworks is an indication of a bigger problem; the widening gap between games as a means to entertain and games as a mean for problem solving.

<table>
<thead>
<tr>
<th>Approach to games</th>
<th>Focus</th>
<th>Definition of Games</th>
<th>Use of games</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitive</td>
<td>Productivity/Achieving repeatable patterns and ensured outcomes</td>
<td>Rigid boundaries/list of necessary and sufficient conditions</td>
<td>Research &amp; Pedagogy &amp; problem solving</td>
</tr>
<tr>
<td>Descriptive</td>
<td>Play/Promoting creativity and artistic values</td>
<td>Categories or Descriptions</td>
<td>Entertainment &amp; Communication</td>
</tr>
</tbody>
</table>

Advocates of conceptualizing games through defining their main properties believe that the process of game design should not be just by trial and error. In this sense by defining main attributes of games one can design games (system) which are productive (ensures a certain outcome) and repeatable. On the contrary, advocates of descriptive approaches believe that games at best can be studied for identifying the factors involved in the success or failure of the game in a certain context; no one can provide game designers with prescribed methods which ensure success as recreating the successful cases is itself a prescription for failure of a game. A definitive view of games, inspired by scientific approaches, is essentially an attempt to produce repeatable patterns for games which ensure achieving certain outcomes while the descriptive approach tries to promote creativity and artistic aspects of games and ensuring the fun quality of games. The qualities of each approach are summarized in table 3-6.
3.5. Game Science or Games and Science? How Successful Games are in Planning Practice?

Despite the widespread use of serious games in scientific fields, several studies report a low rate of success for serious games. Many scholars (Breuer & Bente, 2010; Ritterfeld, Cody, & Vorderer, 2009) argue that serious games in general often fall short in providing a promising user experience; in other words many players find serious games not fun. The same applies to the serious games in planning. In the design of the B3 game which was used as a participatory planning support tool the designer explains that “In [their] experience with designing the B3 game, we faced a challenge to design a fun game with playful elements that can deliver useful results to the urban planners in charge” (Poplin, 2014, p. 507). The efforts to this date to tackle this problem mainly focus on designing better user interfaces, making processes and narratives more fun and making players interested through using novel technologies.

On the other hand, to this date the majority of the designed serious games are used for pedagogy and communication purposes. Very few non-simulation games are designed for research purposes in participatory planning while as shown in table 3-7 the commercial games can fulfil the pedagogy and communication purposes. Referring to the unique feature of games in providing gradual and controlled access to the content of media and their ability in updating the mental model of the players, Koster (2013) argues that all games are edutainments; all games have a certain message in their core and they all use game features to convey the message by updating the player’s mental model in each level of game design. The success of games such as Monopoly and Messenger District Boy assert Koster’s claim. If games in general have these qualities and they are successful in building a large audience then what is the added value of serious games in the scientific field. If serious games fail not merely in one field at one time but in all fields most of the time the defects are likely to be found in a much more fundamental part of game science.

The answer to this question lies in understanding the concept of ‘validity of games’. With the adoption of game science and the influence of dominant system thinking in the 1970s, the focus was shifted from the concept of play as a core of gaming to predictable outcomes. This shift had several implications for game design. By fitting games within the systems thinking approach,
scholars were trying to use games as a scientific tool which can be designed having a specific aim and outcome at hand. In explaining this turn Liebe (2008) explains:

“There is an important difference between the approach to games by Huizinga or Caillois on the one hand and Salen and Zimmerman on the other. The former focus on play as a dominant factor in human history and the cultural development of modern civilizations, whereas the latter concentrate their analysis on aesthetical, design-oriented, or theoretical descriptions of the object game” (Liebe, 2008, p. 326)

Given the importance of the ‘validity of games’ (Peters et al., 1998) in serious game designs the designer should make sure that the conceptual model which is used in the game accurately represents the real world. In this sense rather than focusing on the user experience the serious game designer focuses on defining detail specifications of the game in a way that it is in accordance with scientific theories and models. This is due to the fact that the value of gaming for contexts other than pure entertainment is measured “against the criteria of the analytical and positivist sciences-theory based, valid predictive and so forth” (Mayer, 2009, p. 831).

With highlighting the measures for the validity of games (Peters et al., 1998) within scientific fields, the resemblance of the game world to the real world becomes crucial. As Raser (1969) suggests, “a model can be said to be valid to the extent that investigation of that model provides the same outcomes as would investigation in the reference system”. However as shown in table 3-5, the separation of the game world from the real world is known to be a crucial factor in ensuring the playful nature of the game. In one of his interviews, Tim Skelly one of the most well-known video game designers, talks about the experience of playing games as:

“When the game starts, you have what I think of as the little electronic Zen master, which is anxiety. If you’re careless, if you don’t concentrate on what you’re doing, you’re going to lose a ship and that’s the little Zen master slapping you upside the head saying, "Pay attention, Grasshopper!" So you pay attention you pay lots of attention so that by the time the game is over, as long as it wasn’t a complete washout, you’ve already accomplished one thing, which is that your mind has
been cleared. You feel that your problems are a little more distant than they were when you started playing.”

The early definitions of the play (like the work of Huizinga and Caillois) which came from the fields of psychology and anthropology had this separation of real world and game world at their core. In defining play, Huizinga argued that all play moves take place in a “play-ground marked off beforehand either materially or ideally, deliberately or as a matter of course [...] All are temporary worlds within the ordinary world, dedicated to the performance of an act” (Huizinga, 1955: 10). He then defines play as: “a voluntary activity or occupation executed within certain fixed limits of time and place, according to rules freely accepted but absolutely binding; having its aim in itself and accompanied by a feeling of tension, joy, and the consciousness that it is ‘different’ from ‘ordinary life’” (Huizinga 1955:28).

The separation of the real world and the imaginary world was also emphasized in the conception of games as systems; Salen and Zimmerman (2004) believe that the pleasure of a media experience lies in its ability to sensually transport the participant into an illusory, simulated reality. According to the immersive fallacy (Salen & Zimmerman, 2004), this reality is so complete that ideally the frame falls away so that the player truly believes that he or she is part of an imaginary world. Harteveled (2011) also emphasizes the importance of achieving balance between the worlds of meaning and reality in designing serious games. However the majority of the serious game designers assert the difficulty of achieving this balance and sensually transporting the participant into an illusory reality.

The practice of serious gaming shows that the conception of games as a system is very limiting for the use of games in scientific fields. Scientific fields deal with rules and definite outcomes; artistic artefacts such as digital games deal with principles and perceptions. Therefore an alternative conception of game is required to better situate games within scientific fields. In the next section it is explained how the conception of games as artefacts with embedded information systems can lead us to a broader use of games in planning.
3.6. Games as an Artefact with Embedded Information Systems

To achieve a new conception of games and their alternative uses in scientific fields, new validity measures are needed. It is crucial to explore whether validity of games can be measured against anything other than of the analytical and positivist sciences-theory based criteria. To do so, a deep understanding of the data flow between the real and imaginary world of games is required. Several accounts exist covering how games as a system can be designed and fitted into different scientific fields, however few game models try to capture exactly how the game works as a system; what its components are and how these components work together. One of the frameworks that deals with the internal system of the game is Daniel Cook’s (2012) model of games. Although his model was mainly devised for level design in games, it can be very helpful in understanding how games work as a system. In the following sections we use this model to explain the different ways in which data flow can happen between the real world and the imaginary world of games; it is discussed how these data can be turned into knowledge and what types of knowledge can be achieved using games.

3.6.1. Data Flow between the Real World and Imaginary World of Games

In his model, Cook (2012) argues that all games can be reduced to series of loops and arcs (broken loops). The players start the loop with their mental model of reality (they have a model of how things works in real life). In the game they are provided with series of actions. The players decide to take an action based on their perception of the game world and their mental model of reality. In the game system certain models are used to define what the consequence of each action will be. These models/rules are not visible to the players. The players take an action and instantly receive feedback. By observing the feedback then the players try to unravel the magic box of the models which are run in the game. In doing so the players update their mental model of how things works in the game’s world.

When in serious games the aim is to use the game as a pedagogic tool, the focus is on reflecting the real world logics in the game’s rules. So the ‘right mental model’ or accepted facts in that field (which are conclusions drawn from
real worlds observations and studies) are incorporated into the rules of the game. The ultimate aim of these games is to bring the mental model of the player closer to the ‘right(desired mental model’ incorporated into rules of the game. The rules however can take different forms. In some cases rules are mathematical equations so you want the player to deductively learn about the model. In other cases, the rules reflect the mental model or a worldview and you want the player to become familiar with that. This is the reason why the advocates of serious games often describe playing game as playing by real rules while imagining a fictional world (Juul 2005).

In the case of serious games for communication purposes, the real world references can be incorporated to create the game world as well as the game rules. The story, the setting of the game, available actions and feedback can all be used to convey desired messages. In this case the studies that are undertaken on the link between the real, digital and the virtual cities (Batty & Hudson-Smith 2001; Hudson-Smith et al. 2005; Couclelis 2004) have provided planners with helpful insights on how these imaginary worlds of games can be constructed.

But what happens when games are used for research purposes? The possibility of capturing the players’ actions has been explored in different fields; in fields such as business studies and advertisements there exists a breadth of studies on how people spend their virtual money/resources in video games (Greengard, 2011; Soroush, Hancock, & Bonns, 2014). In Cook’s model this
will be monitoring players' actions; commonly known as game analytics. Different techniques have been developed by game designers to understand how the player interacts with the game world (Drachen, Thurau, Togelius, Yannakakis, & Bauckhage, 2013). Heat maps and built-in action monitor techniques in games are just some of these techniques. The even less explored data source in digital games is the unique potential they offer for capturing the mental model of the players and its changes throughout the game. This will make games a valuable tool for collecting perceptions (mental models) of the players. The ability to update the mental model of the players is a very unique characteristic of games; no other medium can constantly check and update the mental model of its users.

In this sense the games can be considered as a great tool for dealing with tacit forms of knowledge. Tacit knowledge, which consists of mental models, values and beliefs, is known to be difficult to articulate and difficult to put into words, text, or drawings. The key idea here is based on this premise that “valuable tacit knowledge often results in some observable action when individuals understand and subsequently make use of knowledge” (Dalkir, 2013, p. 8). In this sense through using games the tacit knowledge of individuals can be captured without the need for the player to express this knowledge in words or drawings or in groups.

### Table 3-8: Differences between Explicit and Tacit Knowledge

<table>
<thead>
<tr>
<th></th>
<th>Explicit knowledge</th>
<th>Tacit knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nature</strong></td>
<td>- Easily identifiable</td>
<td>- Within person knowledge</td>
</tr>
<tr>
<td></td>
<td>- Relatively easy to share</td>
<td>- Difficult to articulate</td>
</tr>
<tr>
<td></td>
<td>- Intrinsically incomplete, lacks context and requires interpretations</td>
<td>- Hard to share</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Can be shared only indirectly</td>
</tr>
<tr>
<td><strong>Typical examples</strong></td>
<td>- Information</td>
<td>- Institution and insight</td>
</tr>
<tr>
<td></td>
<td>- Know-that</td>
<td>- Practical intelligence, skills and practice</td>
</tr>
<tr>
<td></td>
<td>- Theoretical knowledge</td>
<td>- Know-how and heuristics</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Rule of thumb</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Mental models and beliefs</td>
</tr>
<tr>
<td><strong>Mechanisms for generating and sharing</strong></td>
<td>- Codification</td>
<td>- Practice</td>
</tr>
<tr>
<td></td>
<td>- Documentation</td>
<td>- Personal and team reflection</td>
</tr>
<tr>
<td></td>
<td>- Databases and search engines</td>
<td>- Drawing mental maps</td>
</tr>
<tr>
<td></td>
<td>- Blogs, wikis and intranets</td>
<td>- Apprenticeship</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Social interaction and mentoring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Storytelling and metaphors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- New codification systems</td>
</tr>
</tbody>
</table>

Source: (Goffin, Koners, Baxter, & Van der Hoven, 2010, p. 41)
The summary of the differences between explicit and tacit knowledge is given in the table 3-7. The high reliance of scientific fields on explicit forms of knowledge has made games a good tool for communication and pedagogy purposes while the power of games in capturing the tacit knowledge of their players is usually overlooked. When the power of games in capturing the tacit knowledge of the players is acknowledged, efforts should be made to understand how the game world can be designed in a way that makes it possible for scientists and planners to capture the desired mental model/tacit knowledge. In doing so it is crucial to understand the many ways game worlds inherit elements from the real world.

3.6.2. Fiction and Science Fiction; New Conceptions of Validity

It has been discussed that given the importance of validity of games in scientific fields, the world game is very often a form of a simulation of the real world; i.e. representation of the real world is used to construct the game world. "Representation, which seeks to create resemblances and reproduce something, is the polar opposite of abstraction (and is sometimes conflated with realism) ... To abstract something is to simplify it, reducing it to a few essentials and basic forms instead of trying to reproduce it."(Wolf, 2003, p. 48).

According to Wolf, substantially video games are combinations of imagery and events. As such “their elements can be abstract in both appearance and behaviour”(Wolf, 2003, p. 49). The abstraction in appearance was of the known features of digital games in the 1980s. The technical limitation of computers imposed stark and minimalistic graphics on early video games. However this technical limitation became a unique intersection of art and electronic technologies; making graphics and sounds of early video games very popular. With the advances in technology and the increased capacity of computers in handling improved graphics, the choice of abstraction rather than representation has mainly become an artistic choice of the designers.

Behavioural abstraction however lies in the heart of game rules. On the one hand the actions that are available to the player are always a subset of available actions in reality and on the other hand the logic behind the actions game world varies based on the logic which is taken for granted in the real world. In the game world a stone will hit the ground if it is thrown (as what
happens in the real world based on the laws of physics but it might go 100 meters into the ground regardless of its weight. In behavioural abstractions then fiction (and in the case of serious games science fiction) becomes more valuable than narrative.

By conceptualizing games as an extension of abstract art, Wolf (2003, p. 48) argues:

“Rather than try to avoid or sublimate abstraction, game design can usefully incorporate abstraction, resulting in new gaming experiences and game conventions. Just as computer simulations and mathematical visualization have taken graphic design in directions other than photorealistic representation, abstraction can expand and explore the great potential that the video game medium has to offer”.

Asserting the importance of abstraction Juul (2007, p. 511) argues that:

“The role of abstraction is not simply to make the game different from what it represents, but to make it different for specific purposes ... a consistent level of abstraction work hand in hand to make the miniature world believable, complete, and tractable for both the author and player”

Having this in mind it is crucial for the serious game designers to explore which aspects of the context in which the game is being designed can be abstracted and which aspects needs to be represented in the game world for creating meaningful data on the players’ perceptions throughout the game. In the next chapter, in an attempt to use abstraction for designing games that can be used in participatory planning practices, the nature of the problems in the participatory planning practices and the role of lay knowledge in planning processes are critically discussed.

3.7. Summary

This chapter aimed at critically examining the capacities of digital games through achieving an epistemological understanding of game as a medium. First the historic roles of games in scientific fields were reviewed. The review unravelled the path dependencies that exist in the conception of games as a system. It showed how the specific context of the 1970s (the popularity of urban modelling and rational decision making) has led to conception of
games as system with measurable outcomes and emergence of Simulation and Gaming tradition. The review of current use of games in participatory planning (section 3.3) highlighted the footprints of the Simulation and Gaming trend in the use and design of games. To move beyond rational approaches to games and to explore the capacities of games as medium, the various conceptions of games were reviewed. The chapter argued that the way games are conceptualized and defined depends on the context in which they are being used. Having this in mind the chapter explored the possibility of conceptualizing games as artefacts with embedded information system. It was argued that this conceptualization will provide us with opportunity to define new validity measures. However defining validity measures will not be possible without reaching a thorough understanding of role of knowledge in participatory planning practices which is discussed in the next chapter.
Chapter 4

GAMES AS AN ARTEFACT IN PARTICIPATORY PLANNING

4.1. Introduction

This chapter explores the added value of games for participatory planning practices. Doing so, the chapter begins with discussing the role of knowledge in the emergence of different types of democracy. It explains how the rationality and the knowledge which is taken for granted complement the political system. The chapter then explores the role of knowledge in participatory planning practices. It discusses how planners make use of different types of knowledge; it specifically focuses on the role of lay knowledge in planning and the ways it is incorporated into the planning decision making process. The chapter then outlines the many ways in which the game can be used in planning processes; it is explained what their added value is in different stages and types of participatory planning. The chapter is then concluded with a discussion about the relevance of game to the participatory planning process in a UK context.

4.2. Knowledge and Democracy; on the Long Lost Friendship of Kratos and Demos

Criticisms of the democracy have existed as long as democracy itself. From being critiqued by Aristotle and Plato, and its rebirth in the enlightenment era to its new form in the 21st century, democracy has not always been celebrated as the best system of governance. David Collier and Steven Levitsky (1997) have identified 550 adjectives (i.e. subtypes) of democracy in their
study on the use of word democracy in political studies literature. On one hand, it is believed that this proliferation of ‘adjectives’ helps in reducing the ambiguity surrounding the concept of democracy (Collier & Levitsky, 1997; Schmitter & Karl, 1991) and on the other hand this breath of adjectives has made the discussions about democracy too chaotic (Schedler, 1998). Rather than exploring details of each type of democracy, the focus here is on understanding the role of knowledge in shaping them. The power sensitized understanding of the nature of knowledge gained its momentum with the works of scholars in the Frankfurt school of thought in the 1970s. The core premise in this strand of work is that “knowledge and power are simply two sides of the same question: who decides what knowledge is, and who knows what needs to be decided?” (Lyotard, 1998, pp. 8-9). Flyvbjerg argues that the driving force behind power for seeking out rationality is not the belief that rationality and knowledge are power. Rather, power seeks to define rationality instead of discovering what reality really is; “power defines what counts as rationality and knowledge and thereby what counts as reality” (Flyvbjerg, 2003, p. 319).

Foucault’s analysis of modern power highlighted the importance of understanding the complex nature of the power/knowledge relationship. According to him:

“we should abandon a whole tradition that allows us to imagine that knowledge can exist only where the power relations are suspended and that knowledge can develop only outside its injunctions, its demands and its interests ... We should admit rather that power produced knowledge ... that power and knowledge directly imply one another; that there is no power relation without the correlative constitution of a field of knowledge” (Foucault, 1979, p. 27).

Having this in mind, it is crucial to understand how the rationality and knowledge that are taken for granted have historically shaped different types of democracy. Democracy, the combination of the words ‘Kratos’ and ‘Demos’, is translated to ‘rule by the people’. However the word ‘demos’ carries a much more complex meaning in ancient Greek language. According to Cederman (2001, p. 144) the word demos refers to “a group of people, the vast majority of which feels sufficiently attached to each other to be willing to engage in democratic discourse and binding decision-making”. The importance of a shared goal and the ‘sufficient attachment’ for creation of demos has also
been highlighted in other scholar’s work (Dahl, 1989; Weiler, 1999). This sufficient attachment has been conceptualized and achieved in myriads of ways since the start of civilization.

4.2.1. Engineered Demos in the Rise of Scientific Knowledge

In the practice of Athenian democracy, ‘motherland’, with its limited boundary, was known to be the source of attachment among citizens (Christ, 2012). In effect, foreigners and slaves were excluded from decision making. The random selection of 6500 citizens to exercise power regardless of their expertise, background or social status is a testament to the reliance of the system on the innate knowledge of the citizens; accepting that human beings do have innate knowledge of virtue and justice which makes them eligible for judgements (O’Brien, 2006). Taking innate knowledge for granted made all the citizens equally powerful and the direct democracy possible however the failure of the decision making system in various contexts, which led to the collapse of Athenian democracy, opened arguments on the validity of innate knowledge in taking decision. Scholars started arguing for assigning a stronger role to ‘a priori’ knowledge and education systems. This transition from innate to a priori knowledge however, was not a sudden one. Critics of direct democracy such as Socrates and Plato had long questioned the eligibility of laymen in taking decisions. According to Socrates only knowledgeable guardians were the ones who had the knowledge and the desire to run the city (Duncan & Steinberger, 1990).

When democracy was revisited in the Enlightenment era, the ancient reliance on posteriori knowledge was replaced by scientific knowledge (Audi, 2003; Lemos, 2007). The scientific revolution and its achievements in the 18th century made human beings, their needs and capabilities, the centre of attention; “autonomous individual, capable of free choice and motivated by self-interest” (Trend, 1996, p. 11). Democracy was not anymore about people or elites themselves being governors; it was about ‘the public’ versus ‘the government; it was about optimizing the relationship between the government and the governed. The democratic ideal in this context was giving the public the chance to influence the government with the help of knowledgeable elites and to make sure that the private benefits of individuals are protected against the public benefits. In this ideology, citizens became a subject and
elites became engineers of the ‘common concern’ and therefore engineers of ‘demos’.

In the late 19th century and the start of the 20th century the universal human with its problems became the centre of attention and technological advances became the provider of solutions. Homogenizing the needs, problems and solutions became the main element of modernism. And therefore value-free science in its pure universalist approach continued to be the main source of knowledge and the source of truth; “The value-free ideal sees science as neutral: Scientific claims are true or false and depend on evidence independent of anyone’s moral or political views, and though the correct application of moral or political values may depend on what the facts are, the appropriateness of such values is a matter quite independent of facts about the world.” (Kincaid, Dupré, & Wylie, 2007, p. ).

4.2.2. From Homogeneity to Agonism; Deliberative Democracy and New Collective Knowledge

The second half of the 20th century witnessed a change in “the relationship of suppliers and users of knowledge to the knowledge they supply and use” (Lyotard, 1984, p. 4). Knowledge was not an end in its own right; rather it was a commodity and valuable and therefore its exchange became desirable. The works of scholars in the Frankfurt school of thought critiqued the logical positivism and shed a new light on how society and logic can be defined. Habermas introduced the concept of communicative rationality and outlines its conditions:

“a free speech situation, which is (as much as possible) devoid of external constraint and of strategic behaviour, accessible to all, and in which only the unforced force of the best argument counts—what Habermas calls the “ideal speech situation”; consistency between discourse and beliefs as well as consistency between discourse and behaviour: each participant should be “rationally accountable” of what she says, and should commit to strive to respect what she has argued for, by offering justifications and reasons and by acting consistently;

Transparency: each participant's references and values should be made explicit and the standpoint from which he perceives his inter-
est should be open to others’ critique; a focus on common interest: participants should strive to address a common interest beyond the mere adjustment of particular interests.” (Van den Hove 2006: 12)

The main aim of communicative rationality was to emphasize duality and critical knowledge and to avoid the desire for unitary and totalizing truth and “programming of the social whole as a simple tool for the optimization of its performance” (Lyotard, 1984, p. 12) as it was the case in the modern era. However it did not succeed in distancing itself from the rationalist view of the modernity. Mazumdar (1992, p. 55) argues that “both Habermas and the trends he sought to counter remained limited by universalist and rationalist framework in their perceptions and arguments”. On one hand the complete compliance to communicative ideals meant the elimination of the role of elites as representatives (Allmendinger, 2009; Mazumdar, 1992). And on the other hand the whole idea was relying on the ‘rationally accountable’ participants. In the same strand of thought the ‘information deficit model’ was developed by social scientists studying the public communication of science in the 1980s. This model was built based on two premises; 1) that the public scepticism towards science and technology is mainly to their lack of adequate knowledge and 2) therefore by providing and enabling access to sufficient information about science and technology scientist can overcome the public’s lack of knowledge. As Bickerstaff puts it the information deficit model was mainly “a one-way, top-down communication process, in which science filled the knowledge vacuum of the uninformed general public” (Bickerstaff, Lorenzoni, Jones, & Pidgeon, 2010, p. 2).

The ideal of communicative theory was that demos will be shaped through communication and reaching consensus. However in practice communicative theory became the effort to educate the public about what should be their ‘common concern’ (Bickerstaff et al., 2010). Many scholars critiqued Habermas’s ideas on communicative rationality. According to Bernstein ‘any society must have some procedures for dealing with conflicts that cannot be resolved by argumentation – even when all parties are committed to rational argumentation.’ Foucault argued that the role of engagement should not be about resolving the power relation rather it is believed that communication “undermines and exposes it, renders it fragile and makes it possible to thwart it” (Foucault, 1980, pp. 100-101).
4.2.3. The Information Age and Democracy

With the advances in information and communication technologies at the start of the 21st century, the definition of democracy was revisited in the light of an emergent Information Age. These new technologies not only made a great deal of information accessible to a large number of people, they have also lowered the cost of acquiring non-expert knowledge (McGinnis, 2012). The transformation in the way information is gathered and distributed has resulted in a paradigmatic shift in society (Hague & Loader, 1999). The new paradigm is characterized by active learning and collective actions. As Melucci (1996, p. 220) describes:

“Democracy in complex societies can only mean the creation of conditions which allow social actors to recognize themselves and be recognized for what they are or want to be; conditions, that is, which lend themselves to the creation of recognition and autonomy. In this sense, democracy means freedom to belong, or, freedom to construct social spaces of recognition. Thus defined, democracy is also freedom of representation, freedom to express identity in systems of representation which preserve identity over time”

In a similar vein Forester (1989) argues that in the Information Age, society has become a hybrid concept; it shapes and dies based on the matter at hand. Being part of a society is not anymore bounded to geographical boundaries; it is not the total compliance to that society’s rules and norms; rather societies are shaped based on their members’ shared interest and goal. In this sense, “a definition of democracy [in this era] must include two further freedoms: the freedom not to belong, as the right to withdraw from one’s constituted identity in order to create a new one, and the freedom not to be represented, as the right to reject or modify the given conditions of representation” (Melucci, 1996, p. 221).

It is in this context that understanding New Media becomes crucial. It is believed that the new modern information technologies provide the opportunity for widespread communicative action and it endorses individualism and self-fulfilment (Malina, 1999); the increasing number of vlogs (video blogs), weblogs dedicated to reviews on products and services and the variety of existing social networks are all testament to the increasing quest of people for
testimonial knowledge; sharing and receiving other’s opinion rather than relying on the scientific reports. In this way reputation itself becomes a source of power; as Newmark (2012, p. x) expresses “by the end of this decade, power and influence will have shifted largely to those people with the best reputations and trust networks and away from people with money and nominal power.” According to Rheingold (1993) “public electronic networks (PENs) represent a new form of ‘digital democracy’ as a result of their emphasis on citizen-to-citizen communication” (Malina, 1999, p. 27). Using these communication technologies is believed to help the public in sharing and forming their matters of concern. In this sense on one hand we are approaching a time in which the matters of concern and therefore the demos once more can be shaped by the public themselves rather than being engineered by the experts. On the other hand scientific fields are also becoming more aware of the importance of adopting human-centric views of science.

Visualization techniques (such as infographics) are being used extensively to make sense of scientific data for laymen. To deal with the science communication problem more and more scientists have started collaborating with artists to better connect with society and to survive in the power relations of the reputational societies of the 21st century (Newmark, 2012). The collaboration of Zaha Hadid (a famous architect) and Will Pharrell (a famous pop singer) on designing Adidas shoes is one of the examples of such interdisciplinary efforts to change the media of fields which are traditionally scientific. The collaboration of scientific fields and non-scientific ones is a great opportunity for fields such as planning to better understand the application and the construct of other sorts of knowledge.
4.3. The Role of Knowledge and Planners in Planning Processes

The origin of planning as a practice and the nature of issues it deals with have always been a point of disagreement among planning scholars (Allmendinger, 2009; Reade, 1987; Sager, 2005). Planning emerged in the boom of modernism where the concept of professionalism was “founded on some form of elitist and privileged knowledge that serves a public interest” (Allmendinger, 2002, p. 3). Figure 4-2 which was published in the ASOP (American Society of Planning Officials) Newsletter in 1967 nicely illustrates the perceived role of planners back in its early days. In this issue of the newsletter planners are introduced as “leaders of men, urging progress with quiet but unrelenting persistence” (Whittemore, 2015). The modernist so called “comprehensive-rationalist” (Bäcklund & Mäntysalo, 2010, p. 338) theory of planning, was based on the assumption that knowing and valuing can be mutually separate. However this notion of science soon became problematic.

In the wave of the new ideas on knowledge and rationality derived from the Frankfurt school, planning could not survive unchanged. The postmodernist turn, valuing different sorts of knowledge questioned the possibility of defining unified public interest and neutrality of science and therefore challenged the possibility of planning to exist as a profession (Allmendinger, 2009). The failure of previous plans and the declining legitimacy of planning also made the deliberative turn an opportunity for planners to reconnect with the public and to defend their position (Sager, 2005). Efforts were made to translate Habermas ideas into planning practice. Ideas such as transactive planning
McGuirk (2001, p. 198) in his study summarizes the discussed role of planners in the communicative planning literature. He discusses that the role of planners is more of a ‘critical friend’ whose task involves ‘shaping attention’, ‘guiding judgements on how claims are justified and validated’, ‘mediating and negotiating outcomes’, and ‘anticipating and counteracting misinformation, clarifying, elucidating policy options and implications, and challenging misrepresentations and flawed appeals to legitimacy’. Later advocates of narrative rationality (Landry, 2006; Sandercock, 2004; Sarkissian & Wenman, 2010) suggested different roles for planners. Sandercock (2010) talks about “planning as a performed story”, Throgmorton (1992) called planning a persuasive storytelling and Forester (2000) considered stories to be essential in reconciliation and dealing with conflicts. The role way of the planners is defined in communicative planning literature reveals that although planning scholars and practitioners keep trumpeting recognition of different sorts of knowledge and therefore more democratic approaches in planning, they still work within the frameworks of the deep rooted and unchanged “legacy of an elitist self-image” (Allmendinger, 2002, p. 3). The choice of terminology in planning literature, using verbs such as guiding, providing, clarifying, counteracting, “organizing of hope” and “changing the stories that people tell themselves everyday” (Sandercock, 2010, p. 26), itself is a testament to the unchanged authoritarian perception of planning.

Referring to discussions on inclusiveness and decisiveness, scholars (Allmendinger, 2009; Bäcklund & Mäntysalo, 2010; March & Low, 2004) suggest that the practice of planning will always remain limited to the boundaries of the broader political system of its context and therefore the existing institutional settings impose certain limitations on planning practice. Allmendinger points out that “though planners [in the context of the UK planning system] still portray themselves as apolitical and technically expert, roughly 80 per cent of them are employed in the public section, through which they are charged with carrying out preferred policies of central and local government”
(Allmendinger, 2009, p. 27). Therefore “the absolute claim to ‘truth’ in planning theory would involve a loss of power and discretion by planners” (Allmendinger, 2012: 24). Acknowledging this association between the planner’s role and the dominant governance system and between the role of planners and the role of the public, Backlund and Mantysalo have mapped the association between citizen’s role, planning theory and democracy paradigms as shown in Figure 4-3.

Alexander (2005, p. 92) argues:

“On the one hand, prevailing doctrine, reflecting a progressive agenda and the realities of much planning practice, questions the exclusive claims of ‘objective’ scientific-empirical knowledge and demands recognition of ‘appreciative’ knowledge, experiential improvisation, and common sense ... On the other hand, planning is still a professional practice, and a profession must command specialized knowledge that is unavailable to ordinary people. The simultaneous demand for professional expertise and the denial of expert knowledge confronts planning with a paradox that raises the basic question: What knowledge is necessary to plan? But this question subsumes others - What is ‘to plan’? What do we need to plan for? Whose knowledge is necessary to plan? Which leads to ‘What do (professional) planners need to know?’

Understanding what knowledge and skills planners need to fulfil their tasks very much depends on the context of the planning in question, the type of planning system and the question at hand. In 1969, Arnstein (1969) introduced a framework (figure 4-4) that explains different levels of participation in relation to levels of, or access to, power; a graded changes upwards in 8 rung from manipulation of citizens, through informing and consultation to
citizen control. As Collins and Ison argue (2006) “the ladder depicts participation as essentially a power struggle between citizens trying to move up the ladder and controlling organisations and institutions (intentionally or otherwise) limiting their ascent to the ‘top’ and barring citizen’s ability to claim control or power for themselves”. Despite the popularity of the metaphor of ladder in framing general discussion on approaches to community engagements, several scholars (see for example Haywood et al, 2005; Tritter and McCallum, 2006) have casted doubt on the validity of the framework.

![Figure 4-4: Ladder of Participation](Source: (Arnstein 1969))

Bishop and Davis (2002) argue that a linear notion of participation presume that the policy problem remains constant. As McCallum (2006, p.165) argues:

“A linear, hierarchical model of involvement – Arnstein’s ladder – fails to capture the dynamic and evolutionary nature of user involvement. Nor does it recognise the agency of users who may seek different methods of involvement in relation to different issues and at different times. Similarly, Arnstein’s model does not acknowledge the fact that some users may not wish to be involved.”

It is important to acknowledge that the ways in which planning, its tasks and the role of the planner and the public is conceptualized derives from the knowledge which is taken for granted. For example, Friedmann (1987) conceptualized planning as a ‘radical practice’ which aims at social transformation which is directly linked to his view about knowledge that claims that “all knowledge is perspectivist and provisional” and that in search for meaningful actions, scientific planning discourse should change to express subjective reality (Friedmann, 1987, p. 415).
Planners make use of these different types of knowledge in different stages of the planning process. The study of Krizek et al. (2009) illustrates how in practice the different types of knowledge is incorporated into the rational decision making processes of planning. Although the multiplicity of knowledge is celebrated in participatory planning it is crucial to point out that planning need not be democratic at all times (March and Low, 2004). For example Krizek et al, (2009) argue that rational scientific models continue to be favourable when largely technical decisions are being made. “Facts or information are not themselves evidence; they become evidence when they are used in conjunction with other facts to prove or disprove a proposition” (Davoudi, 2006, p. 20) however the propositions that are defined in planning are often investigated without general knowledge (Krizek et al., 2009).

4.4. Planner’s Conception of Lay Knowledge; Demos Vs Experts

While experts are dependent on scientific data for decision making, the public actively creates knowledge and understanding in their everyday life. For the lay public the physical environment, the environmental pollutions, land uses and social norms are not separated from the living environment (Irwin, Simmons, & Walker, 1999). On the one hand, studies show that the experts contextualise the layman’s understanding of problems as ‘misunderstanding’ due to lack of knowledge and on the other hand, scholars (Allmendinger,
2002; Bond, 2011; Miessen, 2010; Peattie, 1968) believe that in most cases communities find their expressed concerns lost in translation in the final plan. Bäcklund and Mäntysalo (2010, p. 341) argue that planners “are dealing with a conflict between conceptions of reality when the participants already at the outset have different understandings as to whether there may be a planning problem in the first place.” Referring to this, Leino and Laine (2012) explain that in the practice of participatory planning often the matter of concern (i.e. the reason for which the public are involved) is overlooked. Leino and Laine blame planners in not taking into account the matters of concern. However they overlook that the nature of communicative planning and seeking consensus is about forming the matters of concern rather than responding to it. This has also been reflected in the evaluation frameworks which are designed for assessing the success of participatory planning practices. In 1999, Innes and Booher suggest three types of effect for consensus building in the process of participatory planning (Figure 4-6).

In this framework shared problem frames and the ability to work together for agreed ends (first order effects) are considered to be the outcome of the consensus building process rather than its prerequisite. As discussed in section 3.2, this lack of a shared problem or understood shared problem has big consequences for democratic processes. As Tironi puts it “without an issue, there is no public, and without a public there is no democracy” (Tironi, 2013, p. 83).

Two trends have emerged in the last few years to deal with the limitations in problem definition phases in planning; Smart Cities (Cisco model) and Citizen Science (Wikipedia model). The available technologies have enabled decision makers and companies to gather large amounts of data about citizens and their interactions with the city. It is believed that these ‘smart technologies’ help planners in modelling and planning cities with more certainty. Considering the work that Cisco has done to develop technologies for this purpose, Picon (CCAcchannel, May 2, 2014) calls this the authoritarian way of using urban technologies the ‘Cisco Model’. Despite the widespread use of this approach, scholars (Biegelbauer & Hansen, 2011; CCAchannel, May 2, 2014) argue that the producers of the data in the current settings of the so-called ‘smart cities’ are not necessarily the ones who are benefited and empowered (Viitanen, & Kingston, 2014). The companies that own these data possess
more power than citizens to make use of the produced data and this will not necessarily lead us to more democratic cities. In the words of Leo Hollis (Poole, 2014) “in truth, competing visions of the smart city are proxies for competing visions of society, and in particular about who holds power in society ... Like Google, they will have enough data not to have to ask you what you want.”

The other trend is Citizen Science; also known as the ‘Wikipedia model’, a grass-roots bottom up data production and collection method. Citizen science is defined as “the involvement of non-professional scientists in data collection and, to some extent, its analysis” (Haklay, 2013, pp. 105-106). According to Irwin (1995, p. xi) “‘Citizen Science’ evokes a science which assists the needs and concerns of citizens- as the apologists of science so often claim. At the same time, ‘Citizen Science’ implies a form of science developed and enacted by citizens themselves”. Trends such as ‘participatory urban sensing’, ‘Volunteered Geographic Information’ (Goodchild, 2007) are all examples of use of this trend in planning processes. Given the reliance of these trends on the available technologies, it is worth reviewing how different technologies have been used in planning practice to help planners in dealing with these different types of knowledge.

**4.5. Planning Tools and Art; If All You Have is Science Everything Looks like a System**

In the 1960s with the rising popularity of models and the use of computers in planning processes, digital maps were adopted in planning. Digital maps and systems provide planners with more opportunity to create interactive sys-
tems, however because these systems were complex the information generated was only used by professional planners. In 2009, Forth et al. summarized the evolving link between planning and technology in general as shown in Table 4.1.

<table>
<thead>
<tr>
<th>Period</th>
<th>Approach</th>
<th>Technology</th>
<th>Role of Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960s</td>
<td>Planning as applied science (Rational planning)</td>
<td>Large mainframe computers, beginning of GIS</td>
<td>Information technology expert driven, closed system, lack of public participation</td>
</tr>
<tr>
<td>1970s</td>
<td>Planning as politics (Advocacy planning)</td>
<td>Advent of desktop computers and development of GIS software applications</td>
<td>Criticism of information technology as reinforcing existing power structures</td>
</tr>
<tr>
<td>1980s</td>
<td>Planning as communication (Communicative and deliberative planning)</td>
<td>Emergence of public participation GIS, webGIS, CAD, GPS, remote sensing</td>
<td>Emerging role of information technology for community engagement in a transparent manner</td>
</tr>
<tr>
<td>1990s and beyond</td>
<td>Planning as reasoning together (Collaborative planning and design)</td>
<td>Planning Support Systems (PSS), Wikification of GIS, Google Earth, Web 2.0 services such as social networking sites, blogs, mobile media, video/photo sharing, digital storytelling, 3D visualisation and virtual worlds such as Second Life, Neogeography.</td>
<td>Role of technology in providing new opportunities for social interaction, deliberations to address common goals/concerns</td>
</tr>
</tbody>
</table>

Source: (Foth, Bajracharya, Brown, & Hearn, 2009, p. 100)

Following the scientific-analytical and rational approach to planning (e.g. Sal et & Faludi, 2000), when Planning Support Systems (PSS) were introduced at the beginning of the 1990s, the focus was mainly on their instrumental capacities and they were designed specifically with having professional planners as their main audience. PSS was defined as “geo-information technology-based instruments that incorporate a suite of components that collectively support some specific parts of a unique professional planning task” (Geertman, 2008, p. 217). The use of PSS was based on this basic premise that the rational analysis and scientific insight would lead to better decisions and plans (Pelzer et
al., 2014) and therefore its success was mainly measured by the quality of its outcome. However, in the last two decades with the shift in planning towards ‘communicative’ rationality (e.g. Healey, 1992; Innes & Booher, 1999), the emphasis of PSS have also changed (Deal & Pallathucheril, 2009; Geertman, 2006; Klosterman, 1997). According to Klosterman (1997, p. 51) “Planning Support Systems should facilitate collective design, social interaction, interpersonal communication and community debate that attempts to achieve collective goals and deals with common concerns”. These qualities of PSS are highlighted in other studies as well (Boroushaki & Malczewski, 2010; Hopkins, 2001; Klosterman, 1997; te Broemmelstroet, 2010; van der Hoeven, Aerts, van der Klis, & Koomen, 2009). In 2005, however, Vonk and Geertman noted that “the widespread adoption and implementation of PSS in planning practice are dragging far behind the supply of PSS tools” (Vonk et al., 2005: 44). They provide two explanations for this underuse of PSS; firstly that the design of the current PSS does not match the contemporary responsibilities of the planners and secondly that the planners have not yet explored the possibility of the use of new technologies which can better fit their responsibilities.

Revisiting narrative rationality in different fields such as human computer interaction, planning, health and education opened new insights to the ways in which information overload and limitations of PSS can be overcome. Data storytelling (also known as visual storytelling) emerged as a trend which intended to facilitate communication through making data understandable and available to the non-expert (Eccles, Kapler, Harper, & Wright, 2008; Gershon & Page, 2001; Krum, 2013; Segel & Heer, 2010). As Schmitt (2009) expresses “today’s consumer seems to have an insatiable appetite for information, but until recently making sense of all of that raw data was too daunting for most. Enter the new ‘visual scientists’ who are turning bits and bytes of data- once purely the domain of mathematicians and coders - into stories for our digital age” (Schmitt, 2009).

There seems to be a paradox in the use of new media to tackle the limitations of issue formation in planning processes. On the one hand the literature celebrates the power of the new communication technologies in producing and collecting new forms of knowledge and on the other hand these technologies are mainly used to either educate the laymen about planning issues and concerns or to collect information on those aspects of the public’s life that can be
discussed and analysed in scientific terms and rationality. In this sense one of the main unique qualities of new media, being powerful in dealing with their user’s perception and tacit knowledge, is not used in planning processes. In the next section it is argued how this can be explained by the high reliance of planning on scientific frameworks.

4.5.1. Art and Science Distinction

In discussing the modern conception of art, Mortensen (1997) argues that conception of art has never been separate from conception of science, politics and economy. According to him many talk about art through the lens of the ‘compensation thesis’. According to advocates of the compensation thesis:

“The increased interest in the arts must be seen as a reaction to the growing prestige of what we would now consider a scientific approach. According to this line of thought, when empirical and scientific forms of explanation of natural phenomena become predominant, nature, including human nature, becomes objectified, which leads to a break or a form of loss in relation to earlier, more holistic approaches. Those who feel this loss find in the arts a sphere where it can be overcome or compensated” (Mortensen, 1997, p. 64).

Although some scholars have lent plausibility to the compensation thesis, and the same trend to some extent can be seen in planning practices, Mortensen argues that this conception of the art and science relationship cannot capture all the aspects of this complex issue. Despite the different explanations which are provided for this distinction, there is a consensus over the fact that scientific fields deal with rules and definite outcomes and artistic fields deal with principles and perceptions. Schatzberg (2012, p. 558) argues that “art and science are divisions within knowledge in general, distinguished by the nature of their object: art is directed toward action, science toward contemplation”. In this sense, science is the knowledge produced through thinking and art is the knowledge produced by practice. In an effort to merge these two divisions of knowledge in the industrial age the concept of ‘applied science’ was introduced which aimed at using the pure science findings in devising practical solutions and knowledge. Despite the widespread adoption of the concept, several scholars have critique the relevance and rightfulness of the concept in discussing these two different types of knowledge.
To better understand how the artistic and scientific tools can be used in planning processes it is crucial to understand how science and art fields approach making social change. Given that the art fields deal with perceptions, the social change through art starts with influencing individuals and their perception. Art forms do not necessarily directly influence the life world of communities; rather they influence perception of individuals of that life world. Artists create an artefact with a message in their mind and they leave the interpretation of that art work to the consumer of that artefact. In effect, despite the differences among users of that art work, that art work will inevitably lead to emergence of a community of people who appreciate that art work. When the community is shaped, the impact of that art work will not be limited to individuals anymore. Take for example punk rock music and its social impact. With their anti-establishment lyrics, punk rock musicians expressed their political views. In a short space of time they managed to create a big community of fans; fans who were not necessary having the same perception of messages in that music, but were all appreciating the art work and its message. Studies (Hansen & Hansen, 1991) show significant individual differences among fans of punk music, however when the community was created, new forms of collective behaviours, in terms of dressing, behaving in public or even talking emerged.

On the contrary, planning (and other fields which rely on rational processes) as a scientific field, tries to influence individual’s current and future life world through changing parts of that life world. By introducing regulations, creating certain types of buildings, providing or limiting certain types of transport,
etc., they impose a certain life world and hope that through the applied changes and their consequent social influences, individuals belonging to that society will behave accordingly. Planners with their techniques and tools try to capture the current state of people’s life world, they construct their perception of that life world, its deficiencies and potentials and they plan for its future. In this sense, social impact in planning is a prescriptive top down effect while in the case of art is the bottom up naturally emerged effect.

But what does it mean for planning to be art? Although planning can be redefined based on the philosophy of art the study of planning as an art form is beyond of the scope of this study. Here we mainly focus on how the public’s perceptions as tacit knowledge can be used to foster democratic practices in planning.

### 4.5.2. Can Games be Useful in Piercing the Wall of Democratic Planning?

The ‘scientification’ of new media in fields such as planning, has limited the possible use of them; in the case of computer games in planning, games are only being used for communication or pedagogy purposes. On the one hand the potentials of the new media as a research tool have not been fully explored and on the other hand despite the urge of planners to collect the knowledge, the incorporation of these types of knowledge into planning procedures are still an open debate. Despite these limitations games can be used to help planners in dealing with participatory practices in many ways.

Digital games can be used in the current process of participatory planning as tools for capacity building and pedagogy purposes. In section 3.5 it was discussed that all games do teach their players a certain activity or message. So planners can design games with pedagogic purposes having planning issues and concern at their core. The playful nature of games can be used in participatory focus groups to attract more participants or at least make the participation process more enjoyable for those who attend. The use of games as a pedagogic tool is very helpful in comprehensive, communicative and advocacy planning systems.

However games can help develop new approaches in participatory planning. The way the issue formation process is approached in participatory planning practices has a very critical role in ensuring the democratic nature of the par-
participatory practice (Leino & Laine, 2012); who defines the issue, how it is defined and how it is communicated are all important in dealing with participatory practices. In section 4.2 it was discussed that demos is shaped when a group of people feel sufficiently attached to be involved in the process. Digital games as artefacts (see section 3.6) can be very powerful tools for creating and discovering this sufficient attachment. With the use of digital games, rather than having presumption about what creates the sufficient attachment or imposing one, planners can research the existence of different demos. In this sense the participatory processes are not used for defining the common concerns rather they are used for achieving solutions.

4.6. Relevance of Games to the UK Participatory Planning Toolbox

Given the context in which the design solutions are going to be tested, it is crucial to explore how games can be used in the participatory planning practices in the specific context of England. To do so a brief history of planning regulations which deal with community’s empowerments and public participation is provided. It is discussed what potential exists in the context of the England for games to be used for research purposes in participatory planning practices.

4.6.1. History of Participatory Legislations

Planning tends to adapt very quickly to reflect the dominant ideology and priorities set by the broader political system. According to Allmendinger and Haughton (2012, p. 94) “planning is, after all, the main mechanism through which the state seeks to manage land use changes. As governments change and societal concerns and priorities alter, so planning adapts and evolves”. The political role of planning was highlighted in England when New Labour government came into power in 1997; establishing the policy of modernising local government through promoting public engagement in different aspects of public policy making. According to Allmendinger (2011, p. 3) in the beginning of the New Labour Government “planning was a ‘tool’ to achieve outcomes such as social inclusion, addressing climate change and improving economic competitiveness. If planning ‘didn’t work’, then there was nothing sacred about
it. It could be replaced by other ‘tools’ or approaches”. Several publications such as the Green Paper, Planning: Delivering a Fundamental Change and ‘Empowerment White Paper’ set out the need for delivering fundamental change to the England’s planning system. The importance of “strengthening and widening governance for local areas”, empowerment and promoting democracy was highlighted in the proposed changes. In the Green Paper it was argued that “the [then]-current system is very ‘consultative’ but despite that, too often fails to engage communities. The result of all this is that the community feel disempowered” (DTLR, 2001, p. 4). Acknowledging the lack of national and regional strategies within which these empowerment proposals could be located, a document was published in 2004, called ‘Community involvement in Planning; Government Objectives’, to set out the government’s objective for community involvement which stated that:

“Community involvement in planning should not be a reactive, tick-box, process. It should enable the local community to say what sort of place they want to live in at a stage when this can make a difference. The reforms are designed to provide an accessible system with clear formal stages for participation, which reaches out to groups that have not, historically, easily engaged with planning.”

The new system of development plans was introduced in England by the Planning and Compulsory Purchase Act 2004. In effect spatial planning became the dominant planning doctrine. This act defined engagement as “essential to achieve local ownership and legitimacy for the policies that will shape the future distribution of land uses and development in an authority’s area’ (ODPM, 2005c, p. 8). For a better distribution of power, Local Planning Authorities were obliged to involve stakeholders throughout the process of preparing local development documents and preparing Statements of Community Involvement (SCI) (a document which explains how and when the communities were involved in the process of preparation of local development document) became a mandatory part of every local development plan. New requirements for the preparation and subsequent testing of soundness via the Planning Inspectorate, of a Statement of Community Involvement (SCI) have also been introduced as part of these new plan-preparation procedures. Five principles, or stages, for community involvement were set out in gov-
ernment guidance (ODPM, 2004b, p. 67) for developing local development frameworks:

- The provision of relevant information;
- The opportunity to input ideas and local knowledge;
- The opportunities for participation in developing options;
- The opportunity to engage with actual proposals;
- Feedback on outcomes and progress.

Despite the good intentions the review of the plans in the years after that revealed that consultations were often in “the form of advertising proposals on lamp-posts and collecting written representations without allowing public input into strategies guiding policy control” (Gallent, 2008, p. 312).

In 2010 a coalition government came into power. The preparation of the Localism Act 2011, which emphasized further legislation of local developments was an indication that the 2004 reforms were not sufficient for ensuring the distribution of power (Sturzaker & Shaw, 2015). 2012 however marked a major milestone in the England’s effort to “disperse power more widely in Britain” (HM Government, 2010, 7). The Localism Act came into force in April 2012. This act provided communities with more control over the develop-
ment of their local area through enabling them to make neighbourhood plans (Figure 4-8). Two different political authorities were assigned to preparing these plans: parish councils (which are the smallest elected geographical boundary) and neighbourhood forums which could be established by a minimum of 21 self-selected local 'stakeholders'. According to regulations of Neighbourhood Planning, local communities can choose to:

- Set planning policies through a neighbourhood plan that is used in determining planning applications;
- Grant planning permission through Neighbourhood Development Orders and Community Right to Build Orders for specific development which complies with the order.

The approaches taken for community engagement in planning in the context of UK however have not been celebrated by UK planning scholars. Several accounts have been published criticizing the approaches taken in the existing regulations and plans.

4.6.2. Evaluation of These Efforts; Democracy and Participatory Planning Legislations

The efforts of England’s government to decentralize and redistribute power since 2004 are often criticized for their lack of clarity over what is meant by participation and its ideal state, their inherent inconsistency between the participatory ideals and the existing hierarchal forms of government and overlooking the lack of resources. According to Baker et al (2007, p.82), “despite the outdated and often criticized nature of traditional engagement ‘models’, they still continue to underpin many contemporary policy developments in the field of stakeholder engagement, and in particular, around the structure of recent SCIs. Similarly, the recent ODPM national evaluation of LSPs devised an ‘engagement spectrum’. Once more, referencing and building upon Arnstein’s ‘ladder of participation’”. In-line with the analysis done at the start of this chapter, this study tried to explain these shortcomings of England participatory system through understanding the ways in which demos is defined and shaped and the way lay knowledge is treated in the regulations and plans. In this sense the role of demos and knowledge is explored in the de facto (the actual participation) and de jure (the potential to participate) of participatory planning in the context of the UK.
To better understand participatory planning practices in the UK, it is important to explore how the community is defined; i.e. how according to the principles the ‘demos’ is shaped. The word community in English is the closest word to demos when it comes to talking about planning strategies. The meaning of the word community is “a group of people living in the same place or having a particular characteristic in common”. Despite the literal meaning of the word community, studies (MacQueen et al., 2001) show that ‘community’ is an umbrella term which is used for describing different things; people with the same physical location, people with common interests, people with joint action or activities, people with social ties and relationships and etc.. Among the different UK planning policies which have been published since 2007, only one clearly distinguishes between the two elements of community; in this document it is stated:

“Within any area, the ‘community’ is likely to be made up of many different interest groups, which will come together for a whole variety of reasons. Community groups may focus on ‘place’ – the area where they live and work; or may focus on interests, principles, issues, values or religion. Both types of group may have an interest in planning issues. Some of these groups will be well established and represented. In other cases, however, interests may not be organised and therefore be less able to engage with the formal processes of planning. Individuals may be part of several different groups. Some groups may not be homogeneous, for example large and small businesses. Effective involvement cannot happen without a good understanding of the make-up, needs and interests of all those different groups and their capacity to engage.”

The distinction between ‘having a particular characteristic in common’ and ‘feeling sufficiently attached’, as it is in the meaning of demos is crucial. The presumption in the planning regulations, even in the cases that have considered the community as a group of people with a shared interest is that living in the same place or having a shared characteristic will create that sufficient attachment. This is also highlighted in Davoudi’s study on the representativeness of neighbourhood forums in Neighbourhood Planning. In describing the descriptive representation, “the extent to which representatives ‘resemble’
those who are being represented, by sharing with them common interests and experiences”, she argues that:

“At its face value, descriptive representation shows that attention is paid to shared interests and experiences with those who are being represented in the neighbourhoods. However, the test of representativeness seems to be based on group types, such as businesses, residents, students, developers, fishermen, and so on. Such broad categories fail to recognise the diversities within groups and as such often end up with the ‘usual suspects’, undermining the potential benefits of descriptive representations (Davoudi & Cowie, 2013).”

While the neighbourhood plans do not provide new opportunities for dealing with communities of interest, it opens up opportunities for shaping communities of place. The neighbourhood plans give a high flexibility for defining the area of the plan. The neighbourhood area can go beyond the local authorities and parish boundaries; it can be parts of one parish or it can be multi-parish areas. It is stated in the regulations: “Neighbourhood Plan produced by a parish or town council does not have to cover the whole area of the parish or town. A Neighbourhood Plan can cover just part of your parish or town if you prefer. Alternatively, a Neighbourhood Plan can extend across parish boundaries”. The mechanism through which these neighbourhood areas can function is stated in the neighbourhood planning regulations.

On the other hand it is discussed that the there is no specification on what the content of neighbourhood plans should be. The issues addressed in the neighbourhood plans can be very broad or very specific “as long as they do not ‘block’ new development and remain within the scope of existing policy in the local plan” (Cullingworth et al., 2015, p. 121). This has been in place to stop the issue of NIMBYism which is often thought to exist in the case of neighbourhood plans; the idea that local people are very unlikely to support new development if given the choice (Healey, 2010; O’Connor, 2010).

Although all these mechanisms are in place several studies show that preparing the neighbourhood plan is often a very costly process, requires lots of resources and access to professional knowledge. In this sense neighbourhood plans are considered to be “supply-driven rather than demand-driven, in the sense that they are created by those with capacity rather than the need to par-
Several studies show the uneven distribution of applications for neighbourhood plans across UK. In the survey of 2013 of the Planning journal it was revealed that "town halls in England’s most deprived areas are least likely to have received applications from local groups to take up neighbourhood planning powers" (Planning, 2013b, p. 4). In this survey the then-submitted 433 applications were studied. The study showed that only 20 of the 45 submitted applications were in the 20% most deprived local authorities. These results are of no surprise. The studies of the patterns of civic engagement reveal the same patterns; Mohan notes that "the most active citizens were more likely to be older, wealthier, better educated, longer-term residents with religious beliefs" (Mohan, 2011, p. 9).

The need for expert knowledge was highlighted in the green paper of 2001 as well:

"Some planning procedures are legalistic and effective participation tends to demand at least some specialist knowledge. People who are inexpert in the workings of the system find this difficult and sometimes community organisations can find it hard to present their case without access to professional advice" (DTLR, 2001, p. 4)

However the government’s strategy to overcome this limitation was capacity building rather than finding alternatives which does not rely heavily on specialist knowledge. The current studies of neighbourhood plans reveal that this has not been achieved in the plans and therefore what communities are left with are regulations that "involve a cynical adoption of the language of radical social movements (about empowerment, self-organization and local democracy) in order to endorse a conservative agenda whereby 'poor populations are expected to take responsibility for and to self-manage the issues they face, rather than fostering a democratization of power and leaving aside any questions concerning the redistribution of wealth or social solidarity" (Bacqué and Biewener, 2013, 2209).

Despite the fact that many scholars criticize the tensions and mismatch between the ideal of the government and the chosen strategy of government, many of the limitations of the neighbourhood plans can be explained by understanding what localism is about (Bryson & Crosby, 1992; de Sousa Briggs, 2008; Leighninger, 2006; Saegert, 2006; Stone, Henig, Jones, & Pierannun-
“Localism is about ‘top down’ reforms whereby responsibilities, funding and authority are to be taken from parts of government and passed to other bodies such as local authorities”. In this sense as x puts it:

“Civic engagement rather than being about devolving power to more localized arms of the state, localism agenda is about tapping the capacity of citizens to engage in solving their own problems by working together, sometimes in relationship with the local state and state funded bodies, but also on their own terms. [ ] Those subscribing to this form of localism are concerned to unpack the ways in which sharing space in particular places can provide both the social relationships and the common experiences from which citizens can then engage with each other as well as the state, finding solutions to shared sets of concerns”.

In this sense the post-2004 practice of localism can mainly be seen as a capacity building exercise for local authorities before assigning the task of preparing neighbourhood plans to them (Pacione, 1988; Wilson, 1999; Lowndes, Pratchett, & Stoker, 2001; Barnes, Newman, Knops, & Sullivan, 2003; Barnes, Newman, & Sullivan, 2007; Copus, 2010; Copus & Sweeting, 2012). Therefore these efforts are not mainly about taking into consideration the lay knowledge of local people; rather it is about trying to educate people about planning concerns for them to be able to take care of themselves. This is why the existence of the top down approach and compliance to national strategies should still be in place. And this is why the neighbourhood plans are rarely prepared purely by locals.

4.7. Summary

This chapter explored the added value of games for participatory planning practices. The chapter began by discussing the role of knowledge in the emergence of different types of democracy. It discusses how the rationality and the knowledge which was taken for granted have historically complemented the political system. This was done through focusing on the concepts of Kratos (power) and Demos (the people with a common concern). The chapter discussed that in direct forms of democracy demos is considered as an integral part of democratic society while in representative forms of democracy the creation of matter of concern is considered as a secondary out-
come of democratic processes. In this chapter it was argued that by redefining participatory practices through art philosophy rather than rationality, new validity measures can be defined in planning which consequently will provide opportunities for more practices in direct forms of democracy. This requires rethinking policy and evidence in planning processes and achieving thorough understanding of use knowledge in planning processes. The chapter then discussed the current practices of participatory planning in the context of the UK. The study showed that despite the limitations that exist in neighbourhood planning processes, they can facilitate planners and communities to focus more on identifying and dealing with the matters of concerns rather than communities of place and this can potentially lead to better use of direct democracy in policy making in the context of the UK.
Chapter 5

DESIGN PHASE (PART ONE); DESIGN AND DEVELOPMENT

5.1. Introduction

Following the introduced development lifecycle in chapter two (see section 2.1.3), chapters five and six report on the design phase of this research (Figure 5-1). Chapter five focuses on the definition phase and creation of the first playable version of the game and chapter six reports on the evaluation and playtesting of the game and the applied modifications for the creation of the second playable version of the game.

Following the introduced development lifecycle, this chapter begins with outlining the design problems using the findings of the Rigor (chapter three) and the Relevance phase (chapter four). To do so the cause-effect dependencies of the factors discussed in chapter three and four are mapped and analysed. The main aspects of the solution are then outlined through identifying the suitable design approach and setting the design principles. It is explained how the
specifications of the game have evolved in the iterations and how the elements of the first playable version of Mythoplastis are defined. The chapter is concluded by providing an overview of specifications of Mythoplastis v1.0, including its story, mechanics, aesthetics and technology, which are later used for implementation.

5.2. Definition Phase; Defining the Design Problem and the Main Components of the Design Solution

As discussed in section 2.1.4, the definition phase is mainly about identifying the design problems and delineating the main aspects of the possible design solution. In the Rigor phase the potentials and limitations of digital games as medium were discussed and the differences between conception of games in scientific and non-scientific fields were explored. In the Relevance phase the focus was on exploring the reasons why games are mainly being used for pedagogy and communication purposes in the specific case of participatory planning practices. The nature of the questions that are asked in participatory planning practices, the role of planners and planning tools and the ways in which games can be situated in the participatory planning toolbox were discussed in the Relevance phase of this research.

5.2.1. Design Problem

To better understand the components of the design problem the ‘Current Reality Tree’ (CRT) technique is used. CRT is a logic-based technique that helps identifying connections or dependencies between perceived undesirable effects and their underlying causes (Goldratt, 1990). To be able to define the design problem, those causes and effects which are approachable by design are the identified and highlighted in the CRT. The overall process for defining the design problem is shown in Figure 5-2.

![Figure 5-2: The Process of Defining the Design Problem](image-url)
Figure 5-3: The Current Reality Tree

- The Game Worlds are Designed Too Close to Reality
- The Lack of Understanding of the Types of Data that can be produced by games
- Defined Validity Measures Based on Scientific Rationality (Section 3.5)
- The popularity of conception of games as educational tools
- Lack of emphasis on identification of matters of concern in Participatory Planning practices
- The ambiguity surrounding the role of public in participatory planning
- The place-based nature of practices and their emphasis on communal identity
- The reliance of communicative practices on rational individuals and expertise
- The specific context that games design field was established as a field on its own
- The specific context in which planning field came to existence

Source: Author
Having the cause-effect relationships mapped will make understanding of the possible effects of the addressed issues in the design easier after the playtesting of the game. Based on the discussed points in the rigor and the relevance phase, three main observable undesirable effects can be identified (see figure 5.3); 1) Serious games in planning very often fall short in providing good user experience; 2) Games are rarely used as research tools in participatory planning practices and 3) participatory planning theories and practices fail to identify/address the matters of concerns for which participatory practices are organized. Based on the identified factors that can be incorporated in the design of the game, the main problem which is tackled in this design is **understanding the ways in which the imaginary world of the game and its mechanics can be designed to facilitate the creation or collection of the community’s matters of concern.** To do so the design needs to find a way to use frameworks and techniques from the mainstream game design for abstracting the real world data into the game world and capturing the desired data by monitoring the actions and mental model of the players (Figure 5-4).

To do so, the design should respond to the following questions;

1) How the real world data (such as historical information, stories and statistical facts) can be abstracted in the creation of the game world?
2) How the game world can be designed in a way that enables the designer to capture the individual’s matters of concerns and points of interests in a neighbourhood?
3) What aspects of the mainstream game design frameworks can be used to improve serious game design in providing a good user experience?

5.2.2. **Design Solution: Outlining the Main Components of Design Space**

As discussed in the previous sections a game as a research tool can be successful if it is fun for the players and the link between the imaginary world of the game and the reality is well understood in relation to the aims of the project. Therefore to tackle these questions, this research focuses on the concept of immersion; immersion of the real world data in the game world using narrative immersion techniques and immersion of the player into the game world to ensure a good user experience using player-centric game design frameworks. In the past decade several studies have explored the concept of immersion and its typology (Adams, 2013; Bjork & Holopainen, 2004; Stogner, 2011a, 2011b); the studies that focus on the player’s immersion in the game world can mainly be found in the game design studies and discussion on the immersion of the real world elements in the game world are studied in cinematography, science fiction and design of virtual museums.

![Figure 5-5: The Overview of Design Problems and Solution Space](image-url)
World Building; Immersion of the Real World Elements in the Game World

Whilst the majority of the studies on virtual and imaginary environments focus on the interaction of individuals with the virtual environment (Misra & Stokols, 2012), the studies on representation and abstraction of the real world physical spaces in the virtual world has been of interest to scholars in the field of virtual museum design (Carrozzino & Bergamasco, 2010; Sylaiou, Mania, Karoulis, & White, 2010). The uniqueness of these studies lies in their focus on how the real objects in the museum and physical spaces of the museum can be used to create immersive experiences.

Five types of immersion are used in design of virtual museums; experiential, narrative, theatre, interactive and virtual (Stogner, 2011a, 2011b). Experiential immersion is sensory or aesthetic in nature and does not require a narrative; it is mainly about being in that environment and experiencing it. Narrative immersion tries to use story and character to contextualize objects. In museums this type of immersion is achieved through audio media techniques and using 2D and 3D animations. Theatre immersion is achieved through mixing the narrative immersion with experiential immersion and it is achieved through adding elements such as wind, mist and smell to the animation. Virtual immersion on the other hand according to Stogner (2011a, 2011b) is a web-based or digital full simulation of the museum physical environment; it is mainly about replicating the galleries with great detail and no scale.

Given the existing limitations in this research (time and resources) among all these types of immersion, narrative immersion is the most suitable and feasible type of immersion for the purpose of this research. Experiential and theatre immersion, despite their value and potential, cannot be used in this research as the design process of them is very complicated and resource-demanding. Having the narrative immersion as the main approach for incorporating the real world elements into the game world a number of overlapping techniques and systems can be used; immersive storytelling (Cavazza, Lugrin, Pizzi, & Charles, 2007; Nakatsu & Tosa, 1999), environmental storytelling (Carson, 2000), emergent storytelling (Aylett, 1999), interactive authoring of stories (Carbonaro et al., 2008; Machado, Paiva, & Brna, 2001), plot-based systems (Sgouros, Papakonstantinou, & Tsanakas, 1996) and

Most of these techniques emerged in the fields of fiction writing and cinematography and were later borrowed by game designers in the creation of digital game environments. A combination of these techniques can be used for the creation of the game world depending on the aim of the game, the elements that need to be abstracted, the assigned role to the player and the designer, the desired level of interactivity and the aim of the storytelling (Cavazza, Pizzi, Charles, Vogt, & André, 2009). Therefore it is crucial to define the ideal role and experience of the player in the next section.

**User Experience; the Immersion of the Player in the Game World**

The task of providing a good user experience for the players in this design is centred on the creation of stimuli/challenge for the players. User experience in human computer interaction studies is defined as "the quality-in-use of interactive products" (Bargas-Avila & Hornb, 2011, p. 2689) or the subjective relationship between user and application (McCarthy and Wright, 2004). In game studies user experience is defined using a variety of concepts including immersion, fun, involvement, engagement, flow, and playability. As discussed in section 3.5, in serious game design frameworks the emphasis is on productivity of the designed system and in the mainstream game design frameworks on ensuring the fun qualities of games. The main stream game design scholars have done extensive studies on identifying factors which make games fun and engaging and design approaches that can be used to ensure high quality user experience in games (for a brief review of the changes in conception of user experience see section 3.5).

By reviewing the existing definitions of user experience in gaming literature, Bernhaupt (2015) identifies four major user experience dimensions; aesthetic, stimulation, emotion/affect and identification. Despite the breadth of studies on all the four dimensions, stimulation has received special attention and has become the focal point of studies in game design theory. From the early definition of games to the current works on theorizing fun (see for example the work of Koster (2006) on theory of fun), there seems to be a common conviction that ‘challenge’ is the core element for the creation of stimuli in
digital games (Cox, Cairns, Shah, & Carroll, 2012). According to Melone and Lepper (1987, p. 231) “Activities that provide some intermediate level of difficulty and challenge will stimulate the greatest intrinsic motivation”. Koster (2013) also in his famous work on outlining cognitive psychologic aspects of fun concludes that:

“The brain craves stimuli. At all times, the brain is casting about trying to learn something, trying to integrate information into its worldview. It is insatiable in that way. This doesn’t mean it necessarily craves new experiences - mostly, it just craves new data. New data is all it needs to flesh out a pattern” (Koster, 2013, p. 42).

Dramatic elements of games, the story, challenge, characters and the premise of the games, are known to be influential in creation of stimuli. According to Fullerton (2014), a proper design of dramatic elements can ensure a good game flow which consequently results in a good quality user experience. To better understand how these dramatic elements work together to create stimuli Csikszentmihalyi introduced the concept of game flow (Figure 5-6). The idea is that to maintain the game’s flow the activity needs to reach a balance between the challenges of the activity and the abilities of the player. If the challenge is higher than the ability, the activity becomes overwhelming and generates anxiety. If the challenge is lower than the ability, it provokes boredom.

![Figure 5-6: Flow in the Game](image)

Having this in mind, this design needs to focus on providing a good user experience through focusing on the dramatic elements of the game specifically
the story and the challenge. In this sense, following narrative immersion, real world data need to be incorporated in the storyline of the game.

**Game Design Approach**

To ensure that all the discussed qualities are achieved in the design of the game it is crucial to adopt a game design framework that enables the designer to understand and plot how different parts of the game work and how the players interact with them. To do so, this research employs a combination of two commonly used mainstream game design frameworks (Schell’s elemental tetrad framework (Schell, 2014) and Adam’s game design framework (Adams, 2013)). Schell’s framework outlines the overall components of games and Adam’s framework provides an insight into how player interact with these components. Both frameworks are part of the player-centric game design approach. Player-centric design approach focuses on user-experience design rather than product design and emphasizes the idea that the designer needs to “envision a representative player of a game” (Adams, 2013, p. 30) and make sure that the game meets the player’s preferences and desires for entertainment. With having the duty to entertain in its core, player-centric game design approaches put a lot of emphasis on user experience design.

Schell defines four basic interrelated and equally important elements of the games being Mechanics, Technology, Aesthetic and story. According to him game mechanics are procedures and rules that describe the goal of the game and “how players can and cannot try to achieve it, and what happens when they try”(Schell, 2014, p. 51). His definition of game mechanics is in-line with the common conception of game mechanics in gaming literature; for example Salen and Zimmerman define mechanics as elements that “represent the essential moment-to-moment activity of players. During a game, core mechanics create patterns of repeated behaviour, the experiential building blocks of play” (Salen & Zimmerman, 2004, p. 317). Technology refers to any material that the player comes to contact with while playing the game, from the board game pieces to the game console, joystick, keyboard of the computer and, in the case of the pervasive games, the mobile phone and the physical space in which the storyline of the game takes place. Story is the unfolding of the events and finally aesthetics are the visual qualities which are used to present mechanics and story.
Despite its broadness and abstractness, Schell’s model provides game designers with a very clear picture of how the user experience elements can be reflected in the game components. However, it falls short in addressing any dynamic quality of games. To deal with this limitation and to understand how the player interacts with different elements of the game, Adam’s (2013) framework is used. Adam (2013) considers the player, core mechanics and the user-interface to be the main components of the game. The game design framework for Mythoplastis which is achieved through integration of Adam’s and Schell’s frameworks is shown in Figure 5-7. The discussed aspects of design space (also known as solution space) provide us with the main skeleton of the design; however, it does not specify the genre, storyline, look or game play of the game. Different genres and types of games can be designed using this design space. Therefore to make the design space closer to iterations, design principles are defined.

5.3. Design Principles

To address all the design problems (to find the right balance between the serious game component of the game and the playfulness of it) three sets of game principles (each set are discussed separately in sections 5.3.1, 5.3.2 and 5.3.3) are required; the principles which target the design of the game world principles that target the participatory planning concerns and the principles
that target the provision of a good user experience. The game principles are defined on the purely theoretical basis and therefore in the iterations it is examined whether all the principles can be met or not. To define the principles, game design heuristics (Hochleitner, Hochleitner, Graf, & Tscheligi, 2015) are used because they are based on literature and purely theoretical. The game heuristics are used for evaluating the user experience of the game based on the identified factors by game design experts.

5.3.1. **Principles that Target the Dramatic Elements of the Game**

The chosen approach to immersion of the real world elements into the imaginary world of games is centred on narrative. Narrative immersion has been a point of discussion among scholars in the literature field and in recent years, it has gained momentum in cinematography. To define the world building principles, this research makes use of the distinctive contributions J.R.R Tolkien and C.S. Lewis (1992) made to fantasy writing; the concept of enchantment. The principles are centred on the concept of “Realism of presentation” which was introduced by C.S. Lewis and it refers to “the art of bringing something close to us, making it palpable and vivid, by sharply observed or sharply imagined detail” (Lewis, 1992, p. 57). By studying the critiques of Lewis and the works of Tolkien, Brierly (2015) identifies the design patterns that are used for world building in the works of Tolkien. Three of these patterns are used in this research to define world building principles.

*Principle One: Detailed Descriptions of Imaginary Characters, Things, Places or Events*

To make the imaginary world believable it is crucial for the designer to provide the player with enough information about the imaginary world of the game. This does not necessarily mean that all the required information should be given to the player all at once; rather it is expected that by the end of the story the player will have a clear idea about the different aspects of the imagined world. In the case of interactive games in which the player is allowed to change the storyline, the control over the details and the pace of their unravelling depends on the aim of the game and the storyline.

*Principle Two: Historical Reference*
Historical references (not solely to the real world historical events but historical events of the imaginary world as well) in stories are known to be a great way of making the worlds believable (Shippey, 2014). According to Brierly (2015), “references to historical events give the impression of depth over time. The audience senses that there is more to the Secondary World than is immediately visible, that it has a history just as the Primary World does”. This does not mean that the imaginary world needs to have references to the real world’s history; rather it refers to the necessity of having reference to the history of the imaginary world itself.

Principle Three: Familiarity

The importance of the concept of familiarity has been emphasized by game designers and writers (Au, 2012; Bogost, 2009; Shippey, 2014); the idea that certain elements of the imagined world need to be familiar for the player/reader. Ian Bogost (2009) discusses the concept of familiarity in games in two categories of familiarity of form and subject; familiarity of form is mainly about the game play being familiar to the player; for example, the genre of the game, the rules, controllers and etc. and familiarity of subjects is mainly about the topic/storyline of the game. As he explains: “the familiarity of subjects helps apologize for unfamiliarity of form. George Parker’s early game-Banking built upon players’ basic knowledge of financial practices. Popular casual games in the vein of Diner Dash do the same, relying on player’s familiarity with waitressing, hairdressing, or other professions”(Bogost, 2009, p. 1). The degree of familiarity and the choice of the elements of the real world which will be kept familiar in the game world depend on the story, the aim of the game and the designer’s desire.

5.3.2. Principles that Target Participatory Planning Concerns

The principles that target participatory planning concerns are in place to make sure that the discussed ideals of participatory planning are reflected in the design of the game. These principles are defined as follows:

Principle 1: It is about the individual’s perceptions not the collective ones
The social network games, massively multi-player online games and in general multiplayer games have gained momentum in the past decade. However as Charles and Black (2004) argue, the success of social games is overshadowing the importance of discussions on how individuals interact with games; emphasizing the fact that the games tend to focus on groups of player rather than catering for individual players (Charles & Black, 2004). In the design of Mythoplastis, capturing individual’s perception is central to the solution. Therefore it is important for the game designer to make sure that in the game design the actions of the player will not be influenced by the other players. This does not mean that the game cannot have the element of competition, or that the game cannot be played in teams; rather it means that the introduced challenges in the game need to be accomplished individually. The individual player’s actions can contribute to the progress of the team but for the specific aim of this design, the game challenges should not require team members to decide collectively (i.e. reaching consensus on actions).

**Principle 2: Protecting Player’s Positive Karma**

As Warren Buffett once said, “it takes 20 years to build a reputation and five minutes to ruin it”. Given the crucial role of individuals in this design, a regulatory scheme of reputation system is needed to protect the players from the negative aspects of social encounters in the game world (such as online bullying and abuses). Digital reputations of users (also called karma (Farmer and Glass, 2010)) are now having more and more real-world influences which makes a thoughtful favouring and punishing mechanisms really crucial in design of reputation systems (Clippinger, 2011, Farmer, 2011). It is believed that a well-designed reputation system can make use of Karma as a strong incentive for participation (Farmer, 2011) and cooperation (Whitfield, 2011).

The reputation regulatory scheme can significantly affect the efficacy of reputation systems (Goldman, 2011). The way the reputation information is displayed can greatly influence the extent to which users can judge each other and the extent to which reputation systems can create competition among their users (Farmer, 2011; Clippinger, 2011). There exist various regulatory schemes for dealing with Karma; one can be rewarded based on the time he or she has been a member of the designed system, the amount of their contribution and the quality of contribution. The two common ways of designing these schemes are based on 1) amount of participation and 2) quality of par-
ticipation (Farmer, 2011). Scholars have questioned the effectiveness of the systems which are designed purely based on the amount of participation, arguing that these systems often lead to abuse of the system and information (Goldman, 2011). According to advocates of the second group of schemes monitoring the quality of contribution can be seen as critical part of reputation’s immune system. Farmer argues that “by tying Karma to the quality evaluations of a person’s actions instead of rating the person directly, the score is more reliable and easier to interpret” (Farmer, 2011:15).

By defining what actions are relevant to the user’s reputation, one can identify the ways in which the information about those actions can be obtained. Quality of first-hand information submitted or actions done by the user and user’s rating based on other user’s opinion are both ways to capture one’s reputation in the system however they will lead to two very different user’s experiences. Measuring quality of first-hand information requires an extensive moderation and systems based on second-hand feedbacks are often vulnerable to untruthful reporting and manipulations (Clippiner, 2011; Dellarocas, 2011).

Dellarocas (2011) identifies and studies six methods of displaying reputation information; simple statistics, star ratings, numerical scores, numbered tiers, achievement badges and leaderboards. No matter which method and scheme is chosen, in the design of the game it is important to protect the positive karma of the user and to minimize systematic manipulations of data flow. To do so it should be ensured that the designed system will not use direct ranking and comparisons and that the focus of the system would be on the positive karma (i.e. the negative scoring of the user’s reputation will not be shown publicly). It is also important to design the regulatory schemes in a way that the scoring would be based on the quality of the contributions rather than the quantity.

**Principle 3: Emphasis on communities of interest rather than communities of place**

In section 4.6.2 it was discussed how the emphasis on planning for communities of place has limited the opportunities for democratic planning. To make sure that the design addresses the participatory planning concerns, the design should not directly focus on targeting those people within a certain boundary. This does not mean that the game cannot make use of spatial
boundaries however the spatial boundary should not give extra privilege to the people within it or to limit others.

5.3.3. **Principles that Target the Gameplay Design**

Given that the main approach to the game design is centred on user experience, to define the principles for game play design this research makes use of digital games’ user experience heuristics. With the increasing number of publications in game studies, the use of heuristics for the design and evaluation of the digital games has gained momentum. The use of heuristics for design and evaluation of digital games was first discussed in the human-computer interaction field and its focus is on introducing a set of indicators based on literature that can be used to create good user experiences. There are a number of heuristic frameworks for evaluating user experience in digital games, (Pinelle, Wong, & Stach, 2008; Fedorof, 2002; Desurvire, Caplan, & Toth, 2004) however each framework targets certain types of games and therefore modifications are needed to tailor the indicators to the specific context of this research.

For the specific purpose of this research, the Heuristic Evaluation for Playability (HEP) framework is used. HEP is “a comprehensive set of heuristics [specifically designed for video, computer and board games], based on the literature on productivity and playtesting heuristics” (Desurvire, Caplan, & Toth, 2004, p. 1509). To ensure that the participatory planning concerns are addressed whilst providing a good experience for the player, the concerns of participatory planning and immersion of the real world elements into the game world are translated into heuristics and are used along with HEP to form a comprehensive set of heuristics for the design of Mythoplastis. The comprehensive list of game principles are provided in table 5-1.

### 5.3.4. **The List of Game Principles**

The final list of principles is as shown in table 5-1.

<table>
<thead>
<tr>
<th>No.</th>
<th>Heuristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Goals</td>
</tr>
<tr>
<td>1.1</td>
<td>Overall goal: the player is presented with clear goals early enough or is able to create his/her own goals and is able to understand and identify them</td>
</tr>
<tr>
<td>1.2</td>
<td>Short-term goal: There can be multiple goals on each level (short-term and long-term goals), so that there are more strategies to win</td>
</tr>
<tr>
<td>1.3</td>
<td>The goals of the game should be achievable individually</td>
</tr>
</tbody>
</table>
## Motivation

2.1 The player is receiving meaningful rewards. The acquisition of skills (personal and in-game skills) can also be a reward

2.2 The game does not stagnate and the player feels the progress of the game

2.3 The game itself is replayable and the player enjoys playing it

2.4 Challenges are positive game experiences and encourage the user to continue playing

2.5 The first-time experience is encouraging

## Challenge

3.1 The game is paced to apply pressure but does not frustrate the player

3.2 There are variable difficulty levels for a greater challenge

3.3 The challenge of the game is adapted to the acquired skills. The difficulty level varies so the player experiences greater challenges as he/she develops mastery

3.4 Challenging tasks are not required to be completed more than once

3.5 The game is easy to learn, but hard to master

## Learning

4.1 The player is given space to make mistakes, but the failure conditions must be understandable

4.2 The learning curve is shortened. The user’s expectations are met and the player has enough information to get immediately started (or at least after reading the instruction once)

4.3 General help displaying the game’s fundamentals exists and is a meaningful addition to the game and provides useful assistance before and during the game

## Control

5.1 The player feels that s/he is in control. That includes the control over the character as well as the impact onto the game world. It is clear what’s happening in the game

5.2 The player can impact the game world and make changes

5.3 The game mechanics feel natural and have correct weight and momentum. Furthermore they are appropriate for the situation the player is facing

5.4 The player is able to easily turn the game off and on and resume the missions later on.

## Consistency

6.1 Changes the player makes to the game world are persistent and noticeable

6.2 The game is consistent and responds to the user’s action in a predictable manner. This includes consistency between the game elements and the overarching settings as well as the story

## Game story and Environment

7.1 The meaningful game story supports the game play and is discovered as part of the game play

7.2 The story suspends disbelief and is perceived as a single vision, i.e. the story is planned through to the end

7.3 The game emotionally transports the player into a level of personal involvement (e.g. scare, threat, thrill, reward, punishment)

7.4 When appropriate, reference should be given to familiar stories, places and characters of the context in which the game is taking place

7.5 The appropriate amount of detailed information about the character, places and historical facts are given to the player to enhance the make-believe quality of games.

7.6 Those elements of the reality that needs to be captured as part of the game should be incorporated in the story of the game
<table>
<thead>
<tr>
<th>7.7</th>
<th>The game can have references to current spatial boundaries of the neighbourhoods of focus but the game world should not limit the player based on the official spatial boundaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Feedback</td>
</tr>
<tr>
<td>8.1</td>
<td>Feedback creates a challenging and exciting interaction and involves the player by creating emotions</td>
</tr>
<tr>
<td>8.2</td>
<td>The feedback is given immediately to the player’s action</td>
</tr>
<tr>
<td>8.3</td>
<td>The player is able to identify game elements such as avatars, enemies, obstacles, power ups, threats or opportunities</td>
</tr>
<tr>
<td>8.4</td>
<td>The player knows where s/he is on the mini-map if there is one and does not have to memorize the level design</td>
</tr>
<tr>
<td>8.5</td>
<td>The player does not have to memorize resources like bullets, life, score, points and ammunition</td>
</tr>
<tr>
<td>8.6</td>
<td>The player should be rewarded based on the quality of their contribution as well as the quantity of it.</td>
</tr>
<tr>
<td>9</td>
<td>Visual appearance</td>
</tr>
<tr>
<td>9.1</td>
<td>In-game objects should stand out (contrast, texture, colour, brightness), even for players with bad eyesight or colour blindness and so should not be easily misinterpreted</td>
</tr>
<tr>
<td>9.2</td>
<td>The objects look like what they are meant to represent (affordance)</td>
</tr>
<tr>
<td>12</td>
<td>Menu and interface elements (HUD)</td>
</tr>
<tr>
<td>12.1</td>
<td>The interface is consistent in control, colour, typography and dialog design (e.g. large blocks of text are avoided, no abbreviations) and as non-intrusive as possible</td>
</tr>
<tr>
<td>12.2</td>
<td>The menu is intuitive and the meanings are obvious and perceived as a part of the game</td>
</tr>
<tr>
<td>12.4</td>
<td>Relevant information is displayed and the critical information stands out. Irrelevant information is left out. The user is provided with enough information to recognize his/her status and to make proper decisions</td>
</tr>
<tr>
<td>12.5</td>
<td>If standard interface elements are used (buttons, scroll bars, pop-up menus), they are adhering to common game interface design guidelines</td>
</tr>
<tr>
<td>12.6</td>
<td>The reputation schema will ensure protecting the good karma of the players</td>
</tr>
<tr>
<td>12.7</td>
<td>Those details of the player that is not part of the gameplay should not be displayed for other players.</td>
</tr>
</tbody>
</table>

5.4. The Gaming Platform

Two main factors were used to identify the suitable platform for this game; wide-spread accessibility of the technology and the ease of implementation. Considering that the game needs to reach out to as many people as possible, it is desirable that the game runs on a platform which is highly accessible to a large number of people. Also to enable people to engage in the game whenever and wherever they wish to, the technology needs to be accessible to people at any given time and place. This makes platforms such as board games not a suitable option for this game. The study of Ofcom on the media consumptions by adults in UK (Ofcom, 2015) shows that 89% of adults have access to Internet; among which 69% access the internet using their mobile phone. Consid-
ering this, an internet game which will be accessible on a mobile phone as well, not only will be highly accessible but also provides the designers with technologies which can be used for creating complex imaginary worlds.

To better understand how the medium can influence the success of the game, in this version of the game we tested both internet and mobile versions of the game. The Mythoplastis v1.0 has two parts; the main game comes in the form of an online game and the mobile part of the game comes in the form of a ‘treasure hunting’ style pervasive game. Thus in this version of the game, the pervasive part of the game is seen as an alternative mode of play rather than an extension of the main gameplay; in other words in this version the player can play and finish the online game without the need to complete the pervasive part.

5.5. Game Context; the University of Manchester Campus

The main campus of the University of Manchester, in the UK, is chosen as the context in which the game’s story takes place. Four factors make the campus a suitable choice for implementing and testing the game; 1) the main campus of the University of Manchester and its buildings has an immensely rich and diverse history therefore it provide a potential for testing the world building elements. 2) Being a campus which is accessible to the public, a wide range of people with varying levels of education, age and background can relate to the buildings and places on the campus. In effect not only the design needs to take into consideration a variety of players, the assessment of the game provides us with better insight into how different players interact with the game. 3) The campus of the University of Manchester is shown to be a home for different communities of interest. On a number of occasions, the staff and students of the University have organized campaigns and events to oppose decisions that are made regarding the buildings and the activities on campus (see for example the case of saving the veggie café on the campus (Gregory 2013)) 4) A new strategic plan is being implemented for the campus which involves a great deal of change in the physical environment of the campus and therefore the final version of the game can later be used for understanding and
capturing the common concerns of students, staff and the public who in one way or another interact with the buildings and activities across the campus.

According to the strategic plan of the University of Manchester, “the University has the largest single campus of any higher education institution in the UK, providing 850,000m² of buildings and land with a replacement value in excess of £2 billion” (University of Manchester, 2012, p. 19). The history of the buildings in the campus goes back to 1873 (Pullan & Abendstern, 2004). The majority of the buildings on the campus are named after prominent historic figures in Manchester. The set of buildings that make up the Old Quadrangle were built from 1887 to 1903 (Pullan & Abendstern, 2004).

Given its rich history, the University of Manchester adopted the commemorative plaque policy in 2012 to identify and celebrate buildings and locations associated with prominent historic figures. This policy was in line with the commemorative plaque scheme which was in place in Manchester since 1960. It is believed plaques “can increase a sense of pride and can educate about history and architecture, making both more accessible to people of all ages and backgrounds. They can also play an important conservation role, helping to highlight buildings with historic associations and to preserve them for the future” (UoM, 2015). In 1984 Manchester City Council decided to colour code the plaques; Blue to commemorate people, red to commemorate events of importance to social history of the city; black for buildings of special architectural or historic interest and Green for subjects which fall into none of these categories.

Besides having a rich history, the campus has seen major developments and emergence of modern buildings. In 2012 the master plan for the University of Manchester campus was announced. In this plan it is stated that the

“long-term aim, as restated in our Manchester 2020 Vision, has been to create a world leading university that would compete with the best universities in the world and would occupy a single, outstanding campus, where some of our beautiful old buildings would stand alongside the very best in modern facilities for our research and our students.”

Given that testing the game in a real public consultation process is beyond the scope of this research, a number of locations need to be selected to be incorporated into the game world to test whether or not the game can capture
the player’s perception about that location. In this design, the buildings with blue plaques are chosen to be the points of interest in the game. Therefore the game should be able to capture the extent to which the public care about the buildings with plaques on them.

### 5.6. Design Iterations

As discussed in section 2.4.3, the adopted agile process in this research differs from the regular agile game design processes in that the result of each iteration is not a developed playable game; rather the iterations are done through paper prototyping and in-house evaluation. Through the iterations the main aim of the development process is to achieve the ideal level of abstraction and immersion. To do so as the starting point, the iterations begin with creating a game that is similar to the ‘Simulation and Gaming’ trend; it does not have much emphasize on storytelling and it is designed with direct references to reality. In each iteration then it is decided which features of the previous game environment and story can be abstracted and which features need to be incorporated into the new iteration. With having different levels of abstraction, the game mechanics, game’s rules and player’s actions, also change. In effect, the results of iterations can be game with different genres and stories. Before deciding on which version of the game is adopted for implementation, two iterations were tested in this project (Figure 5-8).

In the previous section it was explained that the main aim of the design is to capture the perception of the public about the buildings on the campus that have blue plaques on them. However, following the formats of the mainstream game testing and the fact that the main aim of the game is testing the game mechanics and storyline, in the playable version of the game which is
5.6.1. Iteration 1: Open Ended Competition

<table>
<thead>
<tr>
<th>Game Mechanics</th>
<th>Game Storytelling</th>
<th>Level of Abstraction</th>
<th>Player Vs. Player</th>
</tr>
</thead>
<tbody>
<tr>
<td>tactical manoeuvring</td>
<td>Broad Narrative – Open Ended Free World</td>
<td>Very Low</td>
<td>Team Playing Competition</td>
</tr>
</tbody>
</table>

In the first iteration, the design mainly follows the current dominant types of serious games in participatory planning; tactical manoeuvring is used along with open ended game structure with a very broad narrative to construct a game play with open-ended competition in its core. In this iteration the player is provided with two options; either to play the game or to contribute to the game. This distinction between playing the game and contributing to the game was to ensure that the game has something to offer to different types of players. For playing the game, the player needs to join one of the three predefined teams; constructors, deconstructors and planners. Once the player joins the team he cannot change the team at any stage of the game. All teams are assigned specific tasks and aims. For example, constructors are only responsible for collecting and creating the good memories/stories about a location.

The ultimate aim for the teams is to take over as many buildings as possible in the defined area by telling stories about that specific building/area (the storyboard of the game is shown in figure 5-9). The role of the reputation system is also highlighted in this iteration. The players not only score based on the level of activity (the number of submitted stories) but also based on the quality of activity (getting more likes and comments from other players on the submitted story). However, acknowledging that the highly competitive nature of such design might discourage certain types of players, the reputations system extends beyond the game and it is also included in the ‘contribution to the game’ section. In effect, opportunities are provided for the player to accumulate points by telling stories about a building/area. In the submission of their story then they were asked to indicate whether they consider their story to be a positive/happy or negative/sad one. According to the
Figure 5-9: The Storyboard of the First Iteration
specified quality of the story by the user, a score is assigned to a building and is saved as a building’s reputation in the database. This version, as expected, can provide qualitative and quantitative data about the buildings/locations.

Table 5-3: Game World Evaluation of the First Iteration

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> In this version, the players score by commenting on the existing locations. This scoring system shift the focus from the quality of submitted stories into their quantity and therefore the submitted stories will not necessarily reflect the mental image of the players from that location.</td>
</tr>
<tr>
<td><strong>2</strong> Having predefined teams with predefined missions limits the responsibility of players and the available actions to them. Especially as it is not possible for the player to switch to another team at any time in this design.</td>
</tr>
<tr>
<td><strong>3</strong> Although there is an advantage in having an open ended environment with minimum story, it is harder in this setting for the designer to control the storyline and if it is necessary to target specific locations, the designer will have no control of the flow of the game.</td>
</tr>
<tr>
<td><strong>4</strong> It is an advantage that the player can choose to submit their story/stories about or start the game from any place that they wish to. Having this open ended environment will give the planners this opportunity to collect data about places without targeting specific location. In this sense the planner can simply capture a screenshot of the game and get the data they want rather than targeting specific locations.</td>
</tr>
</tbody>
</table>

Given that the game aims to capture the perception of the players about certain locations, the idea of giving scores to buildings based on the submitted stories seems to be good game mechanics. However a storyline is needed to match the need for submitting stories/ideas about a location in the game.

Table 5-4: Game Mechanics Evaluation of the First Iteration

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> Providing the players with the option to either play the game or to contribute to the game ensures that a wide variety of players will make use of the designed tool.</td>
</tr>
</tbody>
</table>
The idea that each building/area receives a score makes the further analysis of the collected data easier.

Studies show that emphasizing on the competition as a core mechanism of the game will lead to ‘aggressive behaviours towards other teams/players’ and ‘distraction from the main message of the game’. In this sense in this version players might decide to submit false stories just for their team to win rather than really caring about what that building is or expressing their real perception of the building.

With the defined regulatory system of reputation system in this version of the game, the player is provided with too much information and elements (such as reputation, power, different extra options and the contribution rate) makes it difficult for the player to manage all the elements throughout the game.

Although emphasizing competition in the design of game mechanics can provide incentives for the players to play the game, it will be in contrast with the principles that target the participatory planning concerns (section 5.3.2). An alternative ways of motivating the players is required in the next iterations.

### 5.6.2. Iteration 2: Locations Embedded in the Storyline

<table>
<thead>
<tr>
<th>Game Mechanics</th>
<th>Game Storytelling</th>
<th>Level of Abstraction</th>
<th>Player Vs. Player</th>
</tr>
</thead>
<tbody>
<tr>
<td>Progression</td>
<td>Cut-scene, text-block and Visual storytelling</td>
<td>Medium</td>
<td>Role playing Single Player - With no interaction with other players</td>
</tr>
</tbody>
</table>

In the second iteration, the focus is mainly on finding a storyline that can have references to the locations of interest and making an effort to incorporate locations into the storyline to ensure the distinction between the real world and the game’s world. Instead of focusing on the competition as a driving motivation for the player to continue playing the game, in this version the progression of the storyline and the available actions are the main motivation for the player to continue the game. To do so in this design a character-based plot is chosen and cut-scene and visual storytelling are used to develop a more elaborated game world. In cut scene storytelling the main part of the story is told by the designer and is unfolded for the players. In this sense, the actions of the players can slightly change the details of the story, however the
main storyline is defined by the designer. The overall structure of the story can be illustrated as shown in figure 5-10.

In this iteration the storyline is centred on an Italian gang of drug dealers who are trying to establish their business in Manchester but they require local knowledge to succeed in their business. The player in this scenario plays the role of the chosen agent by the gang whose task is to provide the gang with information about local routes, neighbourhoods and locations. The tasks include for example helping the gang to find safe routes through the city, the areas where most likely they can recruit agents and potential places to sell their products (the storyboard of the game is provided as Figure 5-11). For example, in the first mission the player is told that the gang wants to move their goods from location 1 to location 2. The player is then advised to take into consideration the business of the road, existence of police stations and number of CCTV units. The player is then provided with a map to draw the route and the drawn route is stored in the database as the route which is perceived as being highly suitable for illegal activities (i.e. highly insecure route between the two locations) according to the player.

In this iteration unlike the previous iteration players can only contribute to the game by playing the game and finishing the missions that are defined entirely by the designer. In effect, the player is not given a chance to influence the storyline. Furthermore given the linear structure of the story in this iteration, the player cannot really progress to the next mission unless the given mission is completed. This not only gives the designer the opportunity to lead the player to certain locations but also ensures that all of the players have completed the same desired mission; i.e. the perceptions of all the players are captured regarding the specific location/matter.
Table 5.6: Game World Evaluation of Iteration Two

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative 1</td>
<td>The long storyline makes it difficult for the designer to create and update the new meaningful challenges while making sure that the player’s action will be useful for the planners.</td>
</tr>
<tr>
<td>Positive 2</td>
<td>The specific genre of the story might not be appealing to all the players.</td>
</tr>
<tr>
<td>Negative 3</td>
<td>The linear storyline of the game provides full control for the designer to lead the player to specific locations.</td>
</tr>
<tr>
<td>Positive 4</td>
<td>The character-based plot ensures the distinction between the real world and the game world and consequently will help ensuring the fun quality of the game.</td>
</tr>
</tbody>
</table>

The idea of incorporating the locations into the storyline of the game works really well in this version of the game however, the storyline needs to be changed so that consistent information is captured in each mission.

Table 5.7: Game Mechanics Evaluation of the Second Iteration

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive 1</td>
<td>The level design of the game ensures that all the players have finished the same mission and this ensures that the perception/behaviour of the players about certain location has been collected.</td>
</tr>
<tr>
<td>Positive 2</td>
<td>The fact that the missions and the number of locations (like the start and the end of the path) were already defined by the designer made the analysis of the game easier.</td>
</tr>
<tr>
<td>Negative 3</td>
<td>The lack of short missions which is not part of the long story will makes the game not attractive to casual players.</td>
</tr>
<tr>
<td>Negative 4</td>
<td>The player has minimum control over the flow of the story and changing the elements of the game world.</td>
</tr>
<tr>
<td>Negative 5</td>
<td>There is no opportunity for the player to get to know about other’s input or to socialize with other players.</td>
</tr>
</tbody>
</table>
Figure 5-11: Second Iteration's Storyboard

1. Welcome to the team!
2. Please enter your postcode.
   How long have you been living in this postcode?
3. We need you right now! Our customer is waiting for us in M1 9PL. Take us there quick and safe! We didn’t wanna see any police or CCTV on our way!
4. Well done man!
   You know Manchester very well! We want to expand our team! We need to recruit! Just tell us where we can find good jobless adventurous people like you!
5. You got your first badge!
   Top Criminal
5.7. The First Playable Version; Mythoplastis V1.0

Table 5-8: Summary of Mechanics and Storytelling Techniques in Mythoplastis V1.0

<table>
<thead>
<tr>
<th>Game Mechanics</th>
<th>Game Storytelling</th>
<th>Level of Abstraction</th>
<th>Player Vs. Player</th>
</tr>
</thead>
<tbody>
<tr>
<td>Progression</td>
<td>Environmental storytelling, Cut-scene, and Visual storytelling</td>
<td>Medium</td>
<td>Single Player- Possibility of interaction with other players</td>
</tr>
</tbody>
</table>

Having the outcomes of the iterations in mind, the first playable version of Mythoplastis was designed. Considering the success of the role playing game with progression mechanics at its core, this mechanic is chosen for Mythoplastis V1.0. However to address the limitations of the previous gameplay environmental storytelling is used as the narrative immersion technique in this version to incorporate locations of interest within the game space as well as the storyline. The detailed specification of the first playable version is therefore presented in the following sections.

5.7.1. Mythoplastis Story

In this version of the game the environmental storytelling technique is used along with the cut-scene storytelling. Environmental storytelling not only uses narrative to embed information in the game world, it also makes use of physical properties of the game environment to create the story. According to Carson (2000) by using the environmental storytelling technique “the story element is infused into the physical space ... In many respects, it is the physical space that does much of the work of conveying the story the designers are trying to tell.” Using this technique, real world information such as historic facts can be incorporated in the game world.

To address the issues with linear storytelling outlined in the previous iteration, in the first playable version of Mythoplastis the focus is on providing a consistent game world through a series of individually complete mini stories (Figure 5-12). Having mini stories is not necessary to allow players to complete missions chronologically. As each story contributes to creating the game world and preceding the storyline, each mini mission can be completed without the need for the previous mission to be completed.
In this version the storyline is centred on a man called John who is born and raised in Manchester and moved to France 10 years ago. Recently, he had an accident and is suffering from the effects of a severe head injury. As a result of the accident he has lost parts of his memory. The French medical team, that dealing with the case, is trying to reconstruct his memory to help John remember the parts of his life that have been erased. As part of the treatment they sit with John and record the stories of the bits that he remembers. They have also accessed his notes and belongings to find clues about his past life. Having all the information recorded, they hope to understand John’s life and history. However they cannot figure out what the places are and who the people are that he talks about so they require local knowledge of those in Manchester to figure out who John was and what his history is. Although the player can choose for John to remember his life as it was, the players are informed that they have the opportunity to present Manchester and John’s memories in ways they wish to, rather than the way it actually have been. This provides the players with the opportunity to choose to make John remember Manchester the way it is or the way they wish it was.

Using the environmental storytelling techniques the historical facts and information about the locations are used in creating the clues that are collected from John’s belongings. The study of Hornik et al (2015) shows that people tend not only to react more to negative news they also believe negative more than positive news. Having the outcome of this study in mind, to trigger more reaction from the players about locations of interest and to be able to add more twists and challenges to the story it was decided that the overall experience of John in Manchester will be sad and depressing; the places in Manchester from John’s point of view are filled with bad memories. Rather than trying to put a bad value on the building or the city, John was portrayed as being a depressed person in Manchester and that due to this depression he
had moved to France. As discussed in the previous section a number of random locations are chosen to create the version of the game for playtesting. To make sure that the playtesters are familiar with the locations, numbers of prominent locations on the sides of the main road (Oxford Road) are chosen.

### 5.7.2. Mythoplastis Mechanic for Online Version of the Games

To help John in recovering his memory, a number of actions/rules are available for the players. Following Adam’s (2013) framework the in-game actions and the player’s events are defined as follows:

**PLAYER’S EVENTS**

*Action One: Finding/guessing the right locations*

As the perceptions of the players are collected throughout the game, it is important to make sure that the exact location of interest is identified by the player. In this sense a check is conducted in each mission to determine whether the player has found the right location or not. In each mission of the game, certain clues are given to the player about the location of interest; this is done in the form of a picture that John had from that place, a piece of writing, his notes or a historic fact that he has collected. The player’s mission is then to put these clues together and identify where John had been.

*Action two: Answering how the player wants John to remember the identified place of interest*

When the player identifies the location of interest, s/he is asked to show how they want John to remember that place. This is done using a variety of techniques; through choosing an option from multiple choice questions, writing a letter to John, modifying the clues or creating an imaginary picture of the place. The variety of ways to capture the image the player has in mind are used to test which of these methods are better from the player’s perspective.

*Action Three: Submitting Stories*

The players of the game have also the option to submit their own stories of different places in Manchester to help John recover his memory. This option is included in the game for two main reasons; firstly it helps the player to talk
about the places which might not be included in the main structure of the game and secondly it is mainly designed for those who might not enjoy going through levels one by one but find the topic interesting enough to collaborate.

**IN-GAME EVENTS**

In-game events in the Adam’s framework are the game’s feedbacks to the player’s actions as well as the information and stories given to the player. The in-Game Events are defined as follows:

*Verifying the responses*

In each mission, when the player guesses the location the game will provide immediate feedback on whether the guess is right or not. If the response is wrong a notification is given to the player. The players cannot proceed to decide on how they want John to remember the place without identifying the right location.

*Disabling the completed missions*

When a mission is completed, it is ensured that the mission becomes inaccessible for the player. This is done to make sure that players cannot submit several answers for one mission.

*Level design*

Defining the appropriate difficulty level of missions in the case of the games that do not follow the strict levelling is very challenging; the game designer cannot predict from which mission the player chooses to start the game. In this version of the game to avoid dead-ends the designer provides the player with more clues; after a minute in each mission the player can choose to use hints to be able to find the locations. These hints will lead the players to the right answer without directly mentioning the answer. As such, it is ensured that players will be able to continue the game even if they find certain missions of the game difficult to finish or if they have never been to the locations of interest in the game. Although the storyline changes in each mission the overall mechanics of the game will be the same in each mission. The player finds the point of interest, decides whether s/he wants to keep the place in John’s memories as a good place or a bad one.
5.7.3. Mythoplastis Mechanics for the Pervasive Part of the Game

The pervasive part of the game does not have the same level design of the online version. The pervasive part is mainly about finding the logos which are put in different locations in the city. There are two types of logos; the guiding logos and the location logos. The guiding logos are there to guide the player so that the player can find the main logos. When scanned, the guiding logos provide the player with a text which is mainly a part of the story containing certain clues to guide the player to the location in which the main logos are installed. The main logos on the other hand when scanned lead the player to a form which is to ask the player to express how they want John to remember that location.

5.7.4. Aesthetic; User Interface

As is quoted from Jef Raskin (1970), “As far as the customer is concerned, the interface is the product.” It is a fact that good graphics will not make a bad game good (Gameranks staff, 2010) but a good graphic can greatly contribute to the core game play specifically as the main storyline needs to be reflected in the designed spaces in the game. The importance of the user interface design is acknowledged by many scholars (see for example Ward, 2013; Patton and Economy, 2014; Constantine and Lockwood, 1999).

In section 5.3.2 the importance of keeping the positive karma of the players was emphasized in the game principles. To reduce the negative effect of visible user's reputation, in this version the users' reputation is not calculated. As the game is designed to be played individually reputation scores of the users will not affect the progression of the game in any means. Buildings/places reputation on the other hand is calculated using quantitative and qualitative measures. The quantitative measure is the number of submitted stories about that place/building regardless of the stories being positive or negative. The qualitative data about places/buildings are retrieved from the answers the user gives to questions which are asked at the end of each mission. On the other hand in the registration form of the website, users are asked to give some information such as their full name, age, email, profession and postcode. Players are free to choose any name as their username. This information is saved in the database but are not revealed to other players during
the game. This is a mechanism to avoid any cyber bullying by hiding the real identity of the users.

The user interface is also important for the pervasive part. The logos of the pervasive part of the game also follow the same principles. Two types of logos exist in the pervasive part; Main Logos and Guiding Logos. In the design also there were so many references to the bee as a symbol of Manchester. The worker bee was adopted as a motif for Manchester during the Industrial Revolution, at a time when Manchester was taking a leading role in new forms of mass production. Seven bees are included in the crest of the city’s arms which were granted to the Borough of Manchester in 1842. The bee denotes Mancunians’ hard work during this era and Manchester being a hive of activity in the 19th century.
Figure 5-13: Use Case Diagram of Mythoplastis V1.0
5.8. System Design; Development Specifications and Outcomes

The game's specifications were made into a playable version by implementing the five modules of the game; registration/signing, introduction, missions, submitting stories and view stories. Figure 5.13 shows the use case diagram of the first playable version of Mythoplastis. The technical specification of each module is explained in this section.

5.8.1. Technology Identification

The suitable technologies for implementing the game were chosen based on their ease of learning and their ease of implementation. The use of game engines such as Unity, Unreal, Source, or Torque could have number of benefits. The Unity game engine, in particular, has recently grown in popularity. The Unity game engine is developed by Unity Technologies in Denmark (Craighead et al. 2008) and it makes use of .NET frameworks. Despite the advantages of this game engine (such as ready-to-use modules and graphics), it was decided to create the game from the scratch as a form of a website. This was mainly due to the cost associated with using game engines and the familiarity of the author with HTML and Javascript programming languages.

As a result Node.js was used for handling the server side. Node.js is a server-side Javascript environment which is used to build fast and scalable network applications. Node.js uses an event-driven model that makes the end product very lightweight and efficient. One of the other advantages of using Node.js in this project is that it enables the programmer to make use of the wide range of open source libraries which makes the implementation very quicker. To ensure the flexibility of the system which is crucial in the chosen methodology and research approach instead of SQL database structures, MongoDB is used as the database which is categorized as a noSQL database. A NoSQL database environment is a non-relational and largely distributed database system that enables rapid, ad-hoc organization and analysis of extremely high-volume, disparate data types. In the client side HTML, JavaScript, BootStrap and JQuery are used for producing the views and handling the data. The in-
formation on how to access the code of first playable version of Mythoplastis is provided in Appendix A.

Software development was carried out by the researcher. It took place from September 2013 to December 2015. In order to carry out the implementation the researcher had to go under training on the use of Node.js, and MongoDB, software development principles, and software engineering. This training took place from March 2013 to September 2013.

5.8.2. Intro and Registration Module

The home page of the game provides the players with the basic information about the game, who has created it, how it is played and how it is started and consists of five sections. To take care of the ethical side of the design, it is ensured that the players have enough information about what the project is about to choose whether or not they want to continue the game. Age, postcode and the job of the player is recorded in the database only for research purposes and is not revealed publicly on the website. The structure of the user information in the database is shown in Figure 5.14. When a record is created for a new user, it also sets the completed missions (with their specific names as zero) when the player completed missions these values are updated to make sure that the played missions will be disabled after it is completed.

5.8.3. Setting the Scene for the Player

After registration the new users are directed to an introductory page which introduces John and the storyline of the game and it explains the available

Figure 5-14: The User Schema in Database
options for the players to help John. The page is constructed using a mixture of text and image and it is totally static. There is no interactivity option for the player. It simply works as the help/intro page. This is to ensure that the player has the required information about the available options. The player is then given three choices; to continue with the missions, to go to the storytelling section or to get information about how the QR codes can be collected. At any stage of the game the user can come back to this section and continue with any option that they desire.

5.8.4. Submitting/Viewing Stories

The submitting/viewing section consists of a map which is provided to the players to choose the location about which they are submitting a story. The submission form has three parts; the type of story, text; the overall feeling of the story and the main text of the story. The overall feeling of the story is quantified to make it possible to incorporate the stories to the main story of the game. The Google API is used to create the map. The player chooses the point s/he wants to submit the story by clicking on the map. When the map is clicked a marker appears on the map. To give the player the chance to change the position of the marker, the marker can be dragged anywhere on the map. The player is then asked to confirm the location of the marker. As soon as the location is confirmed the longitude and latitude of the chosen location is saved in the database as part of the story schema. The structure of the story schema in the database is shown in figure 5.15.

5.8.5. Missions

Despite the differences in their graphic and storyline all missions have the same structure. They all have an input bar for the players to guess the location. The verification of the answer is all done on the client-side using JQuery without any connection to the database. When the response is correct the players are directed to a section containing the question or checkboxes which ask them to answer the question on how they want John to remember that location. The responses of the players are then saved in database. Once the response is saved, the attribute in the user scheme in the database which is related to that specific mission is marked as complete. With having the mission marked as complete, the mission is disabled for the player in the missions menu.
Figure 5-16: The Story Schema in the Database

Figure 5-15: Missions
5.8.6. The Overall Structure of Mythoplastis

The overall structure of Mythoplastis V1.0 is shown in figure 5-17.

Figure 5-17: System Architecture of the First Playable Version of Mythoplastis
Chapter 6

DESIGN PHASE (PART TWO); PLAYTESTING AND EVALUATION

6.1. Introduction

Following the introduced development lifecycle in chapter 2, this chapter provides an overview of the evaluation process of the first playable version of the game. The chapter begins with providing a brief overview of the discussed evaluation process in the chapter two. It then reports on the playtesting process and the emerged themes from the playtesting of the game. Having the preliminary results of the playtesting, it then discusses the outcomes of the expert-based evaluation of the game play using the heuristic playability measures. The feedbacks of the planners on the first playable version of the game and its potential added value for participatory planning practices are also explained. The chapter is then concluded by explaining the applied modifications to the first playable version of the game determining the specification of the second playable version of the game and its final game specifications.

6.2. Brief Review of the Evaluation Process

In section 2.1.7 the details of the evaluation process and the methods used were presented. In this section the main components of the evaluation process are briefly reviewed. The evaluation process in this research consists of three main parts:
1. **Evaluating the interaction of the players with the game** (also known as the user experience) using user-based methods; Following the introduced evaluation methodology in section 2.1.7 (see Figure 6-1), the interaction of the players with the game designer is evaluated using participant observation techniques in the playtesting workshop. User experience questionnaires were also used to find out about the overall experience of the player. In addition to understand how the background of the players and their game playing habits can affect the results of the playtesting, a number of players’ characteristics and backgrounds are collected using a questionnaire.

2. **Evaluating the game itself**: its aim, game play and concept. This is done using expert-based evaluation methods (also known as heuristics) and conducting interviews with two game designers. In the interview the preliminary results of the user-based evaluation are also discussed with the game designer to better understand the gaps and limitations of the game and to find the possible solutions to the emerged problems during the playtesting session.

3. **Evaluating the potentials of the game for participatory planning practices** which is done by conducting interview with three planners.

---

**Figure 6-1: the Methodology and Components of the Evaluation Process**
6.3. Devising a Playtesting Plan

Play-testing the game is one of the most important elements of the game development lifecycle (J. Davis, Steury, & Pagulayan, 2005; Fullerton, 2014; Fullerton, Swain, & Hoffman, 2004). The crucial role of play-testing in the development lifecycle is to validate requirements of the game from the user’s perspective. The feedbacks of the play-testers, their perception and experience, have a decisive impact on what the specifications of the game will be. Several game designers have emphasized the crucial role of having a plan in advance for the play-testing session. Finding the representative sample of target group (play-testers), having a clear mind about what aspects of the user experience and game’s usability should be captured in the play-testing session and ensuring the right setting for the testing is crucial in ensuring the success of play-testing session.

Playtesting can be used for four main purposes; to answer specific research questions, sell a concept and demonstrate its key selling points, communicate the design idea or test and iterate the concept. In this research, playtesting is used for testing the concept, playability and usability of the first playable version of Mythoplastis. The objectives of the playtesting in this project can then be defined as:

1) Level format testing; testing the appropriateness of levels and their difficulty level as well as the progression of levels and their content.
2) Mechanics testing; how users perceive the rules, how they interact with the feedback mechanism, rewards and punishments.
3) Graphics test; evaluating whether or not the interface is appealing to the players. It also includes testing how easily players can find the required information and analysing the degree to which the graphics of the game help enhancing the make-believe quality of the storyline.
4) Teaching and message conveying test; is the game successful in conveying the message that was intended to be conveyed? And does the player perceive the message as it was intended?

Having the main aims of the playtesting session in mind in the next sections the structure of the playtesting session, the process for recruiting playtesters and the design of the post-playtesting questionnaires are explained.
6.3.1. Structure and Logistics of the Playtesting Session

Playtesting session can be organized in many different ways. One-to-one, group testing, feedback forms, interview and open discussion (focus group) are just a number of commonly used playtesting formats. For testing the usability and playability of the designed game, most of the main-stream game design groups prefer to do one-to-one testing with a maximum of 10-14 playtesting sessions. In this research given the limited time and resources the group play-testing session is chosen for user-based evaluation. To be able to have the playtesting in a controlled environment, playtesting session is held in a computer lab at University of Manchester (Figure 6-2).

Having the playtesting session in the computer lab has certain benefits. In the controlled environments the negative effects of external influences can be reduced to a large extent. All the players will use similar computers with the exact same processing power, image quality and physical devices (size of the monitor, the keyboard and the mouse). This will make it easier for the designer to test the reaction of the players to the game in the same setting. Also in the group playtesting sessions, observing the time and the ways in which playtesters start interacting with each other, provide the designer with a great insight on the user’s engagement with the game and the characteristics of the playtester himself; the designer can monitor whether the players try to solve the missions’ challenges individually or in team and more importantly at which stages of the game they start communicating with each other.

For the pervasive part of the game, considering the complication in having the pervasive part played outdoors, two guiding logos and one location logo were de-
signed for the playtesting session. The logos were installed in different places in the same building where the computer cluster was located. To make sure that everyone can test the pervasive part of the game, those participants who did not have smart phones to scan the QR codes were put into groups and it was ensured that each group has at least one member with a smart phone.

The playtesting session was organized in three main parts. In the beginning of the session attendees were provided with the URL link to the game. The total time of one hour and half was given to the playtesters to test the game; it was expected that the playtesters spend 45 minutes to complete missions and submit stories and use the other 45 minutes to test the pervasive part of the game. At the end of the testing the feedback form was given to the playtesters for them to fill the form and return it at any time they wish. Then a brief presentation (10 min) was given to the playtesters explaining what the main aim of the game is and how it is thought to be useful for participatory planning practices. At the end of the session 20 minutes was given to the playtesters to discuss any feedback, comments and ideas about the concept of game, its design and its perceived usefulness for participatory planning practices.

6.3.2. Questionnaire; Feedback Form Design

Questionnaires have been long used by the main stream and the serious game designers to evaluate the user experience in the game. While participant observation methods provide designers with a subjective view on how the user interacts with the game, using questionnaires and standardized questions for evaluating the user experience can have a number of advantages. Standardized questions facilitate comparisons between different versions of the game which can later be used for tracking and analysing the effects of applied changes. Having the questionnaire makes it possible to determine whether or not the applied changes have improved the game as intended. Furthermore, when combined with participant observation methods, the questionnaires can provide the designer with a clearer image of user experience; the results of the questionnaires can be used to validate the outcomes of participant observation process.

The aim of using questionnaire in this study however is twofold; questionnaire is used to evaluate the player-experience and to capture information about the internal influences such as game playing habits of the playtesters, their characteristics and their background. The ideas of Schell (2014), Salen and Zimmerman (2004) and Fullerton (2014) were used to shape the overall structure of the questionnaire.
A number of open-sourced playtesting questionnaires (Capstone and Valve game design companies’ feedback forms for example) are used as guides for designing questions which evaluate the game play of the game.

The questions are presented to the playtesters in three sections; General characteristics and habits of the player, evaluating online part of the game and evaluating the pervasive part of the game. To be able to quantify the responses, where applicable, the Likert measurement scale is used. Likert scale is a method of assigning quantitative value to qualitative data (reference). It uses fixed choice response formats and is designed to measure attitudes or opinions (Bowling, 1997; Burns, & Grove, 1997). In the questionnaire, where applicable, the participants are also given the space to further develop on their answers and comments if they wish to.

**The General Background Questions**

The general background and characteristics of the play-testers are captured in 7 questions as shown in table 6-1.

<table>
<thead>
<tr>
<th>Questions</th>
<th>Responses</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often do you play games (of any type and genre)? (QG1)</td>
<td>Everyday</td>
<td>GR11</td>
</tr>
<tr>
<td></td>
<td>Few times a week</td>
<td>GR12</td>
</tr>
<tr>
<td></td>
<td>Occasionally</td>
<td>GR13</td>
</tr>
<tr>
<td></td>
<td>Only on my holidays and free time</td>
<td>GR14</td>
</tr>
<tr>
<td></td>
<td>Rarely</td>
<td>GR15</td>
</tr>
<tr>
<td>What type of games do you enjoy playing the most? (QG2)</td>
<td>Console Games</td>
<td>GR21</td>
</tr>
<tr>
<td></td>
<td>Outdoor Games</td>
<td>GR22</td>
</tr>
<tr>
<td></td>
<td>Online Games</td>
<td>GR23</td>
</tr>
<tr>
<td></td>
<td>Mobile Games</td>
<td>GR24</td>
</tr>
<tr>
<td></td>
<td>Board Games</td>
<td>GR25</td>
</tr>
<tr>
<td>Why do you play games? (QG3)</td>
<td>Socializing with friends</td>
<td>GR31</td>
</tr>
<tr>
<td></td>
<td>Just as a break from work</td>
<td>GR32</td>
</tr>
<tr>
<td></td>
<td>I love adventure and solving puzzles</td>
<td>GR33</td>
</tr>
<tr>
<td></td>
<td>Games are brain exercise</td>
<td>GR34</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>GR35</td>
</tr>
<tr>
<td>Have you ever scanned any random QR code that you have found on street? (QG4)</td>
<td>Yes</td>
<td>GR41</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>GR42</td>
</tr>
<tr>
<td>The information on which of the following options attracts your attention the most? (QG5)</td>
<td>Bus stations</td>
<td>GR51</td>
</tr>
<tr>
<td></td>
<td>Notice boards</td>
<td>GR52</td>
</tr>
<tr>
<td></td>
<td>Lamp posts</td>
<td>GR53</td>
</tr>
<tr>
<td></td>
<td>Walls</td>
<td>GR54</td>
</tr>
<tr>
<td></td>
<td>Pavement</td>
<td>GR55</td>
</tr>
</tbody>
</table>
How often do you walk in the city just for the sake of walking? (QG6)
- Never, I am always in rush (GR61)
- At least once a month (GR61)
- At least once a week (GR62)
- Few times in the week (GR63)
- Everyday (GR64)

Will you scan QR codes if the logo looks familiar to you? (QG7)
- Yes (GR71)
- No (GR72)

**ONLINE PART OF THE GAME**

The user experience in the online part of the game is captured by four questions as shown in Table 6-2.

<table>
<thead>
<tr>
<th>Questions</th>
<th>Responses</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>How would you evaluate your overall experience of playing online part of Mythoplastis? (QO1)</td>
<td>It was boring</td>
<td>OR11</td>
</tr>
<tr>
<td></td>
<td>I liked playing it now but I will not play it later</td>
<td>OR12</td>
</tr>
<tr>
<td></td>
<td>I liked the game, I might go back and check the rest of the missions</td>
<td>OR13</td>
</tr>
<tr>
<td></td>
<td>It was fun</td>
<td>OR14</td>
</tr>
<tr>
<td>Did you find the design of the website appealing? (QO2)</td>
<td>The graphics were distracting</td>
<td>OR21</td>
</tr>
<tr>
<td></td>
<td>Seems as design is compromising for the lack of challenge</td>
<td>OR22</td>
</tr>
<tr>
<td></td>
<td>The website's design was good enough for conveying the message</td>
<td>OR23</td>
</tr>
<tr>
<td></td>
<td>It looked really good and was in-line with the storyline.</td>
<td>OR24</td>
</tr>
<tr>
<td>How would you evaluate the difficulty of the missions? (QO3)</td>
<td>They were very difficult, I had hard time finding the answers even with the given clues</td>
<td>OR31</td>
</tr>
<tr>
<td></td>
<td>Some were difficult but I could find the answer using the extra clues</td>
<td>OR32</td>
</tr>
<tr>
<td></td>
<td>It was a good level of difficulty; not too difficult not too easy</td>
<td>OR33</td>
</tr>
<tr>
<td></td>
<td>They were too easy and predictable</td>
<td>OR34</td>
</tr>
<tr>
<td>How would you describe the variety of the missions? (QO4)</td>
<td>The variety of the tasks from one mission to another was confusing</td>
<td>OR41</td>
</tr>
<tr>
<td></td>
<td>I preferred to have one or two at least repeating rather than having new task in each mission</td>
<td>OR42</td>
</tr>
<tr>
<td></td>
<td>The variety of the missions did not affect the game experience anyhow</td>
<td>OR43</td>
</tr>
<tr>
<td></td>
<td>it was good that I had options as I am better in certain type of missions than others</td>
<td>OR44</td>
</tr>
</tbody>
</table>
PERVASIVE PART OF THE GAME

And finally three questions are asked from the playtesters to evaluate the success of pervasive part of the game (table 6-3)

<table>
<thead>
<tr>
<th>Questions</th>
<th>Responses</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did you find the pervasive part of the game fun? (QP1)</td>
<td>I did not find it interesting</td>
<td>PR11</td>
</tr>
<tr>
<td></td>
<td>It was fun but I will never do that on street on my own</td>
<td>PR12</td>
</tr>
<tr>
<td></td>
<td>I liked walking around the building and searching for logos but I will not scan the codes</td>
<td>PR13</td>
</tr>
<tr>
<td></td>
<td>The pervasive nature of it was fun but the storyline was not appealing</td>
<td>PR14</td>
</tr>
<tr>
<td></td>
<td>I find the pervasive game experience really fun</td>
<td>PR15</td>
</tr>
<tr>
<td>Do you find the design of the logos appealing? (QP2)</td>
<td>The graphics were distracting</td>
<td>PR21</td>
</tr>
<tr>
<td></td>
<td>Seems as design is compromising for the lack of challenge</td>
<td>PR22</td>
</tr>
<tr>
<td></td>
<td>The website’s design was good enough for conveying the message</td>
<td>PR23</td>
</tr>
<tr>
<td></td>
<td>It looked really good and was in-line with the storyline.</td>
<td>PR24</td>
</tr>
<tr>
<td>Let us know about your experience more. (QP3)</td>
<td></td>
<td>PR31</td>
</tr>
</tbody>
</table>

6.3.3. Approaching and Recruiting Playtesters

Finding, motivating, and retaining play-testers are of the challenging parts of play-testing session. The common approach in the main stream game design for finding the sample of playtester is to construct a profile of the target population of players; how old they should be, should they be predominantly male, female or split, and do they need any prior knowledge to be part of the testing. The target play-tester profile in this study is shown in table 6-4.

The potential playtesters were approached using two methods; by email and through Facebook events invitations. Given that the storyline of the game takes place in the University of Manchester's campus, the invitation to the playtesting session was first sent through university list-server to all the staff and postgraduate students of the School of Environment, Education and Development at University of Manchester (figure 6-3). To be able to reach out to
the people who work outside academia, a Facebook event page was created and advertised to different Manchester-based game design groups and the general public. A very brief explanation of the session, the purpose of the game, the general requirements and the description of the playtesting setting were provided in both invitations.

### Table 6-4: The Playtester’s Profile

<table>
<thead>
<tr>
<th>ASPECT</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age Range</td>
<td>Above 18- the wider the age range the more ideal the playtest will be.</td>
</tr>
<tr>
<td>Sex</td>
<td>Any- would be ideal if there will be an equal mix in the playtester group</td>
</tr>
<tr>
<td>Required Prior</td>
<td>Yes – It is preferable that the players will be familiar with locations and places in the Manchester</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Any</td>
</tr>
<tr>
<td>Background</td>
<td>Any</td>
</tr>
<tr>
<td>Education level</td>
<td>Any</td>
</tr>
</tbody>
</table>

27 people responded to the invitations. 20 agreed to attend the playtesting session to test the online and the pervasive part of the game and 7 who were not able to attend the workshop were sent a URL link to the online part of the game and a copy of the feedback form. However since they were not able to test the pervasive part of the game, they were asked not to answer those questions that directly target the user experience in the pervasive part of the game. From the total 27 people who playtest the game, 21 were students and 6 were working in private sectors outside academia. From the 21 play-tester who were in academia, 15 were urban planning students and staffs, 2 were studying chemical engineering, 1 was from computer science and 3 were studying geography. 19 of the play-testers were in their twenties, 5 were in their thirties and 3 of the playtesters were in their forties.

![Figure 6-3: Invitation Letters for Playtesting Session](image)
6.3.4. **Results of the User-Based Evaluation; Player’s Interaction with the Game**

The user experience analysis is done using three sets of data; the recorded data in the game’s database on the number of completed levels and submitted stories, the data collected from the questionnaires and the data that is gathered using participant observation techniques. The results of the analysis can be discussed under four main themes; immersion, user interface, level design and identification.

6.3.5. **User Experience; the Immersion**

The number of completed missions and submitted stories, especially for those who tested the game on their own can be a good indicator for analysing the success of the game in attracting and holding the attention of the players. The retrieved data from the User Schema (for more information see section 5.7.2) and Story Schema (for more information see section 5.7.4) of the database shows that majority of the play-testers have completed 3 or 4 of the missions (Figure 6-4). As expected those who were not present in the playtesting session and tested the game on their own had higher rate of mission completion. This is mainly because they had more time compared to those in the playtesting session to interact with the game.

![Image](image.png)

*Figure 6-4: The Rate of Mission Completion in Playtesting Session and among Other Playtesters*

In the case those who attended the playtesting session, the number of completed missions cannot be used as an indicator for evaluating the success of the game in holding the player’s attention. However the fact that three out of seven play-testers who tested the game on their own have not finished all the
missions shows that the game has not been very successful in holding the player’s attention and compelling them to finish the missions. The success of the game in holding attention of players in the case of those who attended the playtesting session is analysed using the data gathered through questionnaires. 20 of the 27 playtesters have found playing Mythoplastis fun, 6 have mentioned that they find the concept of the game very fun and that they believe with few changes in the game, it can become a very fun game to play. 1 of the playtesters however has found neither the concept, not the game fun. The results of questionnaire also show that the game has not been very successful in holding the attention of the players. In response to the question regarding the overall experience of the player 10 playtesters have expressed that although they liked playing the game, they will not play it later while 15 playtesters have answered that they will go back and check the rest of the missions after the playtesting session.

While the effort in the design was to make the missions fun, enjoyable and challenging for the players and the section of the game which was designed for submitting stories was more seen as complementary part for those who do not want to be engaged in the missions, the results of the playtesting show that the players have really enjoyed submitting their stories and reading others’ stories. 11 playtesters have specifically written in the feedback forms that they want to see this part of the game more highlighted and better linked to the missions; “I enjoyed writing my own stories and adding them to the map. It will be really exciting once we can see and read other people’s stories on the map itself”. The data on the number of submitted stories shows that 10 playtesters have submitted more than one story and all the playtesters who tested the game on their own and all but five of those who attended the playtesting session have submitted at least one story.

The results show that while the pervasive part of the game has been successful in attracting the player’s attention, it has failed to hold the player’s attention and consequently is has fallen short in providing a good user experience. In the feedback forms the playtesters have expressed that they have found the pervasive nature of the game fun but they have not enjoyed the storyline and the content of the pervasive part of the game. According to the players the storyline of the pervasive part of the game, its disconnection from the main missions in the game and the lack of clues and guides for finding the
logos have led to the failure of the pervasive part of the game in providing a good user experience.

6.3.6. **Level Design and Difficulty of Missions**

While the gameplay of the game did not follow any strict level design (the player could start completing missions from any of the available missions), during the playtesting session, it was observed that all but three play-testers chose the mission which was on the far left of the screen as their starting point and completed the rest of the missions chronologically; moving towards the right side of the screen. Despite all the efforts which were put into the non-linear level design of the game, the majority of the players followed a chronological pattern to complete the missions.

While majority of the playtesters were happy with the difficulty level of the missions, 10 playtesters have mentioned in the feedback forms that they have found the missions very difficult to complete even with the given clues. According to one of the playtesters:

> “The clues were there but only for someone who has been to the place several thousands of times. The rain poem I have seen only once before because I never walk there. I only found it from the given clues”.

Other playtester have expressed that “I might not know how to answer them [missions] if they are not about the university”. On the other hand 10 playtesters have expressed that they found the missions very easy to complete. As one playtester has written in the feedback form “some of the missions could be a little more challenging”. The other playtester has written “give more time before offering hints (make it less intrusive)”.

6.3.7. **Identification with the Story and the Character**

In the design of the first playable version of Mythoplastis, in order to improve the dramatic elements of the game and to make the storyline more interesting and complex, John was portrayed as a depressed person. However the storyline of the game has received numbers of feedbacks from the playtester. 18 playtesters expressed that “John needs to be happier” and the overall mood of the game needs to be more positive. The results of the user-based evaluation show that the players have not identified with the main character. 10 of
the playtesters expressed in different ways that they found it hard to empathize with John as his experiences were very different from the ones they have in the same places. One playtester has written “Storyline is slightly irrelevant to me but in general I think the game’s concept was successful”. The other playtester has written “I really don’t like John. Why should I help him?”

The failure of the game in engaging the player in the storyline of the game can also be seen in the content of the stories that are submitted. The player is told to tell stories which can help the medical team in France to make John remember places therefore it is expected that the stories will be more focused on the quality of the place or its unique feature. However from 30 submitted stories, the contents of 14 of them are not relevant to the storyline of the game; rather they are informative statements such as “I like this place, my desk is here in this building” or “I park my bike here every day”.

This shows that the game has failed in expanding the storyline beyond the missions and linking them to the pervasive part of the game and the section in which the players can submit stories. According to one of the playtester “John’s story was interesting but the narrative was a bit limited and I didn’t understand the story from the QR codes”. Other playtester has mentioned that “I wasn’t sure about how the QR codes were related to the game. Would help if they were more interactive or interrelated with the game.”

6.3.8. Educational Value of the Game

Educating the players about different locations in their neighbourhood was a secondary aim of this game. The main idea in the design was to find a way to abstract real world information into the game world. Therefore in the design of the playtesting and the questionnaire evaluating the educational value of the game was not highlighted at all. However 10 playtesters have specifically written in the feedback forms that they have enjoyed playing the game as it makes them more aware of their surrounding environment. One of the playtesters has written that “it was a moment to think about buildings that I walk past and hardly notice everyday”. The other playtester in response to the overall experience of playing the game has written that the game is very educational. Given that the players have found the game educational, the game have succeeded in abstracting and incorporating the real world data into the game world.
6.3.9. The User Interface Design

The overall experience of the game was influenced by different user interface design choices. The recorded data in the database shows that despite using platforms such as Google map API which are familiar to the users and providing the option to change the zoom and the extent of the map, players only submitted stories within the provided default extent and zoom. The lack of clear directions on what the player can submit as a story and where the stories can be based, the inappropriate choice of default zoom and extent of the map to start with and the storyline and the plot of missions which emphasize the locations within the campus can be a number of factors that have influenced the use of map by the players in the game.

The collected data through questionnaires shows that 23 of the 27 playtesters found the design of the website appealing. According to the playtesters the graphic user interface design matches the overall mood of the game however as they want to see a game with happier storyline, the user interface also needs to change. The use of brighter colours in the website was suggested during the playtesting session.

Despite a good response to the user interface design of the online part of the game, 25 playtesters did not like the design of QR codes. The word “sinister” is used 8 times in describing the design of the logos for the pervasive part of the game. In the playtesting session the point was raised by few playtesters that although the design of the QR codes contain certain references to Manchester and it match the storyline of the game, the sinister design of the QR codes makes them less trustable and therefore unlikely to be scanned.

6.3.10. Internal and External Influences; How Gaming Habits of the Players and External Factor Affect the Feedback

The results of the playtesting session and the feedbacks can be better explained by the playtesters gaming habits and external factors that influenced the user experience during the playtesting session. The data that is used for analysis of the internal and external influences are mainly gathered from the questionnaires and the participant observation methods.
GAMING HABITS AND EXPERIENCE OF THE PLAYERS

A high correlation is found between the gaming experience of the players and the perceived level of difficulty and the overall experience of the game. The flow of the game is achieved through balancing the challenge and the skill of the player. Those who play games very frequently have more skills and therefore higher level of challenge is needed to ensure a good flow of the game.

On the other hand, the experienced players are more familiar with patterns in the game. They have experience of working with different scoring format and game mechanics. However this is not always a positive point. When a tested and succeeded game patterns emerge, it begins to appear in one way or another in other games. By using and sometime over using the game patterns they become a norm for the player and the player expect to see these elements in the other games as well. Therefore the lack of the elements that have become a norm in game design is perceived as a shortcoming or failure from the game even if that element is not necessary for the aim of the game. For example with the increasing interest in gamification techniques and the widespread use of leaderboards and badges in every aspect of everyday life of people, players expect to see these elements in some sort or another in games. In one of the feedback forms one of the playtesters has written “I cannot see any badges or leaderboard in the game and this makes it boring”.

The familiarity with other games with similar purposes is also very influential on how the player perceives the quality of the game. One of the playtesters has written in the feedback form: “I thought of the game ‘Ingress’ immediately after knowing your game... Ingress is a much more intense game and requires more commitment if one wants to play well, in this case this is more relaxing and free-thought it can get very addictive for some”.

QR CODES: NOT TRUSTABLE!

The quality of the pervasive part of the game to a large extent depends on the right location of the logo and understanding the habits and attitude of the players towards scanning the QR codes that are installed in the city. The results of the questionnaire show that 20 of the playtesters have never scanned a QR code by choice. In the playtesting session playtesters expressed that they will not scan a QR code unless they know what that QR is about and that they need assurance from the company or the group that has created it that it
does not contain any viruses or harmful links. This explains why most of the pervasive games which rely on scanning certain codes or going to certain locations need to be organized as a one-off event with a very well-organized setting.

The idea of using the QR code in this game was that the codes will be installed in different parts of the city for the player to access them anytime and follow the logos to find the desired location if they come across any guiding QR codes rather than having a one-off event. However in the playtesting session the playtesters argued that it is very unlikely that the scanning of the codes happens if it is not organized as a gaming event. One of the playtesters mentioned that:

“I always walk with purpose so I cannot mix walking and playing game together especially if that means that I have to follow other clues after finding the first one. So if I really want to play the game I have to walk with the purpose of finding logos”

THE SETTING OF THE PLAYTEST

Certain aspects of the playtesting setting were influential in the overall experience of the players especially the pervasive part of the game. In our playtesting session both the online and the pervasive part of the game were tested at the same time. This game the players this impression that the pervasive part of the game is a kind of extension to the online part while in the design of the game, the main aim was to have the same storyline and missions on two different platforms. 26 playtesters has commented on the weak blend of pervasive part of the game in the online part of the game in one way or another. Furthermore, as the playtesting session was organized as 45 minutes of testing online part of the game followed by 45 minutes of the pervasive part of the game, the players ended up looking for the QR codes all together in groups. In effect the experience of the pervasive part of the game in the playtesting session was not anyhow a good representation of the real setting for pervasive game and therefore the outcomes of this playtesting session for pervasive part of the game cannot fully reflect how the game will be perceived by users.
6.4. Expert-based Evaluation of the Gameplay

To do the expert-based evaluation the link to the game and the list of game principles were sent to two game designers who are not based in Manchester. This is to ensure that the game designers will evaluate the game purely based on its storyline, gameplay, mechanics and visual qualities rather than its relevance to the case of Manchester or accuracy of the content. The game designers (GD1 and GD2) are asked to rate the success of game in achieving each of the principles from 1 to 5 (table 6-5). Having the scores for each principle, a short semi-structured interview are arranged to discuss their feedbacks and possible solutions to the shortcomings of the first playable version of the game.

<table>
<thead>
<tr>
<th>No.</th>
<th>Heuristic</th>
<th>GD1</th>
<th>GD2</th>
<th>AVERAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Goals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>Overall goal: the player is presented with clear goals early enough and is able to understand and identify them</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>1.2</td>
<td>Short-term goal: There can be multiple goals on each level (short-term and long-term goals), so that there are more strategies to win</td>
<td>3</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>1.3</td>
<td>The goals of the game should be achievable individually</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Motivation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>The player is receiving meaningful rewards. The acquisition of skills (personal and in-game skills) can also be a reward</td>
<td>1</td>
<td>2</td>
<td>1.5</td>
</tr>
<tr>
<td>2.2</td>
<td>The game does not stagnate and the player feels the progress</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2.3</td>
<td>The game itself is replayable and the player enjoys playing it</td>
<td>3</td>
<td>2</td>
<td>2.5</td>
</tr>
<tr>
<td>2.4</td>
<td>Challenges are positive game experiences and encourage the user to continue playing</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2.5</td>
<td>The first-time experience is encouraging</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Challenge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>The game is paced to apply pressure to but does not frustrate the player</td>
<td>3</td>
<td>4</td>
<td>3.5</td>
</tr>
<tr>
<td>3.2</td>
<td>There are variable difficulty levels for a greater challenge</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>3.3</td>
<td>The challenge of the game is adapted to the acquired skills. The difficulty level varies so the player experiences greater challenges as she develops mastery</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3.4</td>
<td>Challenging tasks are not required to be completed more than once</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>3.5</td>
<td>The game is easy to learn, but hard to master</td>
<td>3</td>
<td>2</td>
<td>2.5</td>
</tr>
<tr>
<td>4</td>
<td>Learning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>The player is given space to make mistakes, but the failure conditions must be understandable</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>4.2</td>
<td>The learning curve is shortened. The user’s expectations are met and the player has enough information to get immediately started (or at least after reading the instruction once)</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4.3</td>
<td>General help displaying the game’s fundamentals exists and is a meaningful addition to the game and provides useful assistance before and during the game</td>
<td>4</td>
<td>3</td>
<td>3.5</td>
</tr>
<tr>
<td>5</td>
<td>Control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1</td>
<td>The player feels that he is in control. That includes the control</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>
over the character as well as the impact onto the game world. It is clear what’s happening in the game

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2</td>
<td>The player can impact the game world and make changes</td>
<td>3</td>
<td>4</td>
<td>3.5</td>
</tr>
<tr>
<td>5.3</td>
<td>The game mechanics feel natural and have correct weight and</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>momentum. Furthermore they are appropriate for the situation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>the player is facing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.4</td>
<td>The player is able to easily turn the game off and on and</td>
<td>5</td>
<td>4</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>resume the missions later on.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6 Consistency 7.5/10

<p>| | | | | |</p>
<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>Changes the player makes to the game world are persistent</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>and noticeable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.2</td>
<td>The game is consistent and responds to the user’s action in a</td>
<td>4</td>
<td>5</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>predictable manner. This includes consistency between the game</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>elements and the overarching settings as well as the story</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7 Game story and Environment 27.5/35

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1</td>
<td>The meaningful game story supports the game play and is</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>discovered as part of the game play</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.2</td>
<td>The story suspends disbelief and is perceived as a single</td>
<td>4</td>
<td>3</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td>vision, i.e. the story is planned through to the end</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.3</td>
<td>The game emotionally transports the player into a level of</td>
<td>2</td>
<td>3</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>personal involvement (e.g. scare, threat, thrill, reward,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>punishment)</td>
<td></td>
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<tr>
<td>7.4</td>
<td>When appropriate reference should be given to familiar stories, places and characters of the context in which the game is taking place</td>
<td>5</td>
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<tr>
<td>7.5</td>
<td>The appropriate amount of detailed information about the</td>
<td>3</td>
<td>4</td>
<td>3.5</td>
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<tr>
<td></td>
<td>character, places and historical facts are given to the player</td>
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<td></td>
<td>to enhance the make-believe quality of games.</td>
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<tr>
<td>7.6</td>
<td>Those elements of the reality that needs to be capture as part</td>
<td>5</td>
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<tr>
<td></td>
<td>of the game should be incorporated in the story of the game</td>
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<tr>
<td>7.7</td>
<td>The game can have references to the current spatial boundaries</td>
<td>5</td>
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<td></td>
<td>in the neighbourhoods but the game world should not limit the</td>
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<td></td>
<td>player based on the official spatial boundaries (like you</td>
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<td></td>
<td>cannot go beyond your neighbourhood or so)</td>
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8 Feedback 13.5/30

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<tbody>
<tr>
<td>8.1</td>
<td>Feedback creates a challenging and exciting interaction and</td>
<td>1</td>
<td>1</td>
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<td></td>
<td>involves the player by creating emotions</td>
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<tr>
<td>8.2</td>
<td>The feedback is given immediately to the player’s action</td>
<td>5</td>
<td>4</td>
<td>4.5</td>
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<tr>
<td>8.3</td>
<td>The player is able to identify game elements such as avatars,</td>
<td>4</td>
<td>4</td>
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<tr>
<td></td>
<td>enemies, obstacles, power ups, threats or opportunities</td>
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<td>8.4</td>
<td>The player knows where she is on the mini-map if there is</td>
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<td>one and does not have to memorize the level design</td>
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<td>8.5</td>
<td>The player does not have to memorize resources like bullets,</td>
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<td>4</td>
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<tr>
<td></td>
<td>life, score, points and ammunition</td>
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<tr>
<td>8.6</td>
<td>The player should be rewarded based on the quality of their</td>
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<tr>
<td></td>
<td>contribution as well as the quantity of it.</td>
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9 Visual appearance 9.5/10

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<tbody>
<tr>
<td>9.1</td>
<td>In-game objects are standing out (contrast, texture, colour,</td>
<td>5</td>
<td>4</td>
<td>4.5</td>
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<tr>
<td></td>
<td>brightness), even for players with bad eyesight or colour</td>
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<td></td>
<td>blindness and cannot easily be misinterpreted</td>
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<tr>
<td>9.2</td>
<td>The objects look like what they are for (affordance)</td>
<td>5</td>
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12 Menu and interface elements (HUD) 22/30

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<tbody>
<tr>
<td>12.1</td>
<td>The interface is consistent in control, colour, typography and</td>
<td>5</td>
<td>5</td>
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<tr>
<td></td>
<td>dialog design (e.g. large blocks of text are avoided, no</td>
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<tr>
<td></td>
<td>abbreviations) and as non-intrusive as possible</td>
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<tr>
<td>12.2</td>
<td>The menu is intuitive and the meanings are obvious and</td>
<td>4</td>
<td>2</td>
<td>2</td>
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<tr>
<td></td>
<td>perceived as a part of the game</td>
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According to the game designers the main issues in the game play of the first playable version of Mythoplastis is its flow and feedback mechanism.

### 6.4.1. The Issues with the Flow of the Game

By referring to the flow/challenge concept that was discussed in section x.x of chapter 5, both game designers pointed out that the specific level design in the game has negatively affected the flow of the game. Since it is not clear from which point the player will start the missions, the challenges are equally difficult/easy. GD2 stated:

> “There is no information or skills that the player needs to remember from one mission to complete another mission so that makes the missions quite irrelevant to each other … If John’s life is a puzzle of the game, then the pieces do not seem to match or if they do it is really hard to imagine the bigger picture of the finished puzzle to try to put the pieces together”.

The other game designer (GD1) said:

> “It is a nice way of incorporating elements of a non-linear gameplay worlds into the short missions but this gameplay is not really helping the narrative. It is not the level design that is the problem and the story on its own seems interesting but the mix of the two does not seem to work together.”

By referring the work of Romero and Schreiber (2009) on different story structures on digital games, GD1 discussed that the problem lies in the mismatch between the structure of the story and the structure of level design. GD1 explained that although the story has been divided into short missions
the structure of the story is still a linear structure; the player cannot change
the details of the story, there are not multiple paths to get to the end of the
story and the story is not an emergent story so that the players create the
storyline themselves. Having a linear story structure, the levels design also
should match. In this sense, either the game should follow a strict level design
or each mission should have its own full story.

According to GD1 by adding a short introduction and conclusion to each mi-
sion, the aim of each mission becomes clearer and the game can still maintain
its current level design. However if the aim is to find out about John’s life by
putting together the outcome of each mission without directly pointing at the
gained information from each mission then the story needs progression using
strict level design which ensures the right flow for the game.

6.4.2. On the Feedback Mechanism; the Problem with
Lack of Extrinsic Motivations

The high reliance of the game on intrinsic motivation also was highlighted in
the feedbacks of the game designers. The intrinsic motivation refers to activi-
ties that are done out of interest and enjoyment. And extrinsic motivations
are the behaviours and actions that are done to attain certain outcomes (Val-
lerand and Ratelle, 2004-handbook of self-determination research). Accord-
ing to the game designers the lack of extrinsic motivations in the first playa-
ble version of Mythoplastis affects the quality of the feedback mechanism of
the game. In the design of the game the idea was that the progression of the
story and finding out about the John’s life will be the main motivation of the
player for playing the game. GD2 stated:

“There is this trend now that criticizes the use of extrinsic motivations. It is because in gamification they are overusing these techniques. But I don’t think the designs will be successful without using scores, badges or leaderboards. The game can do way better with providing extrinsic motivation. The intrinsic motivation is what makes people start playing the game but you need to have extrinsic motivations to get the players hooked”
On the contrary GD1 also believed that providing few extrinsic motivations can encourage the player to play the game however story of the game can also create a good level of motivation. According to GD1:

"I think more than extrinsic motivations, this game needs a better story structure. The story itself is good enough to make the player curious about things that going to happen next but the level design doesn’t help the player to find the storyline and the way it might progress. Detective adventure games are shown to be popular but they need a good storyline and game world to create that mystery and challenge."

According to both game designers the extrinsic motivations should not necessarily be about leaderboards or badges; rather it can be achieved within the storyline as well. Praising the work that is done by the player from the third person in the story (in this case for example the thank you note from the medical team in Italy) can be one way of incorporating extrinsic motivations into the storyline. According to GD2, the use of extrinsic motivations which are embedded in the storyline of the game is a common practice in creation of adventure video games for decades and they have been proven to be successful.

6.4.3. Ease of Use in Other Cases and the Game’s Maintenance

Another point that was raised in the interview with one of the game designers was about the ease of use of the game in other cases and dealing with the game’s maintenance and progression. GD1 argued that although it is not a requirement for games to be reusable, in the case of games that supposed to be used in specific cases, for financial reasons it is important for the core idea of the game to be repeatable at a very low cost in other contexts. According to GD1 if the financial cost of producing and maintaining the game is of an issue, the choice of role playing adventure game is not very suitable as it requires a great deal of programming and graphic design work. As GD1 says:

"For financial concerns, role playing video games usually try to have a very simple core mechanics. Take for example Grand Theft Auto. They are very detailed in graphics and story but the location is not the main part of the storyline so by changing small details of the storyline, like
characters and missions they can recreate the game in another city in just one year. If the locations are actually part of the storyline and the graphics as it is in Mythopalstis the game can only be used in that specific city and this I guess will make the use of game in other context very costly."

GD1 also pointed out that specifically in the case of online games it is important for the designers to be able to make changes to the game while the game is running. With having the well-defined level design it will be possible for the designers to change certain details based on the players' responses to the first few missions. According to GD1 this flexibility is very crucial for the designers and having complex storyline, graphics or mechanics make achieving this flexibility very difficult.

6.5. Mythoplastis Evaluation; Planner’s Perspective

Mythoplastis was designed as a research tool which can be used for participatory planning practices. Therefore it is crucial to evaluate the usefulness of the game for planning practices. To do so, three interviews are conducted with one junior planner (JP) and two planning students (PS1 and PS2) who were not in the playtesting session. The link to the game is sent prior to the interview and they were asked to test the online part of the game before the interview. The main aim is to understand the perceived usefulness of the game for participatory planning practices, the perceived added value of digital games in general in planning and the existing bottlenecks in the use of games in the planning practices. The discussed points in the interviews can be discussed under three main headings; the usefulness of the collected data, role of the planners and the use of familiar components and tools.

6.5.1. Usefulness of the Collected Data

In discussing the usefulness of the data which is collected in the game, planners mainly focused on the required resources for creating the tool (being digital game) for collecting the data rather than the nature and type of the data itself. All three planners argued that creating a game is very costly and time consuming and compared to the amount and quality of the data that can
be gathered, they do not seem to be the most cost-effective tool available. One of the planners said:

“... and even with all the efforts it might end up being a really boring bad game ... I am not sure whether any consultant is happy to take a risk spending thousands for what they can get for couple of hundred pounds setting up a workshop or taking surveys.”

In addition JP discussed that the collected data is very specific. She further explained that:

“If I want to use such a costly tool I will design it in a way that I can collect series of data rather than just mapping one specific thing. When you make a game which is simulation of neighbourhood you can ask literally whatever you want from the player and you know that the results at least cover half of the questions that otherwise you would have asked people in a focus group.”

Despite the existing scepticism among the planners of the added value of a role playing game, the part of the game that the player can submit his/her stories and view others’ seemed to be very interesting for the planners. PS2 said “I am not very sure about the missions but the part that the public can tell their stories is very interesting and useful.”

When asked about the added value of the public’s tacit knowledge for planning processes, all three planners agreed that there is a value in collecting and analysing behaviours and perceptions of the public. JP said:

“Everyone thinks that planners do not care about public participation and that it is just ticking a box but we do actually learn a lot in the participatory processes. Not many people show up but the ones who attend are really passionate about saying their opinion and ideas. The argument always is that the public cannot see their ideas in the final plan but that doesn’t mean that those ideas have not been taken into consideration. The tacit knowledge of the public is indirectly reflected in the plan. It is not something you can point at and show to that person here it is this bit on the map is your idea.”
While acknowledging the added value of capturing tacit knowledge, PS1 argued that he himself is not very well trained working with such data. He further explained:

“I know that there are so many techniques for analysing qualitative data but they all at the end seem to be very subjective. I am more comfortable with working with numbers and fact. Not that I don’t like the tacit knowledge or that I am against it but that it is not easy for me to analyse it and to incorporate it in the plan.”

In the interviews one could easily notice a distinct difference between the answers of JP who had the experience of working with real cases of planning and PS1 and PS2. Interestingly it seemed that the perception of the role of planners and the usefulness of tools and processes was more negative than the actual experience of JP in real cases of the planning processes.

6.5.2. Role of the Planners

It was argued that the proposed game, Mythoplastis, can be used by planners and communities as a tool for issue formulation or capturing the existing matters of concern. In the interviews that were conducted with the planners, all commented on the vague formulation of role of planners in conceptualizing games for participatory planning practices. PS1 said:

“It is not yet clear for me who design missions? As a planner do I have any control on the game? Or is it just a map that I will use? Say if I have any on-going project how can I use this game? How long should I run the game to get any results?”

PS2 also commented:

“I think you need to make it clear who the user of this game exactly is? If it is for planners then you need a kind of ‘section for planners’ that they can have their tools and controls over the game. If it’s for communities then it is harder to justify it as a planning tool.”

Similar comments also were given when the game was presented in the UK-Ireland planning research conference in Oxford in 2014. Two of the planning practitioners who were present in the session commented on the unclear role
of planners in the design and implementation of the tool while acknowledging the potential the games can have to be used as a planning support system.

6.6. The Overall Evaluation of the First Playable Version of Mythoplastis

The discussed negative and positive attributes of the first playable version of Mythoplastis are summarized in table 6-6. The overall evaluation shows that with modifying certain aspects of game play and level design, the game can provide a good user experience for the players. Players, game designers and planners are all in favour of the core concept and structure of Mythoplastis V1.0. Therefore in the final version of Mythoplastis the shortcomings of the first playable version are addressed by making changes in the game’s level design and feedback mechanism.

<table>
<thead>
<tr>
<th>NEGATIVE</th>
<th>Players</th>
<th>Game Designers</th>
<th>Planners</th>
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<tbody>
<tr>
<td>Level design</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>The ease of reapplication</td>
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<tr>
<td>The limits of the feedback mechanism</td>
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<td>Usefulness of collected data</td>
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<td>The maintenance of the game</td>
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<tr>
<td>The cost of creating and maintaining of the game</td>
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<tr>
<td>The overall mood of the game being sad</td>
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<table>
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<tr>
<th>POSITIVE</th>
<th>Players</th>
<th>Game Designers</th>
<th>Planners</th>
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<tbody>
<tr>
<td>Educational value of the game</td>
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<tr>
<td>The core concept of the game</td>
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<td>The graphical user interface</td>
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<td>The possibility of submitting stories</td>
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6.7. Modifications and Mythoplastis V.2

To address the identified shortcomings of the game in the evaluation process, numbers of changes were made to the game. The modifications mainly target the level design and the feedback mechanism of the game.

Level Design

In the final version of Myhtoplasts the design follows a strict level design. The non-linear structure of the game showed to be incompatible with the narrative structure of the game. Therefore for the designer to have more control over the narrative and to be able to have a gradual progress of the story in the game, a strict level design is followed. In this setting similar to the game designed in the second iteration, the player cannot proceed to the next mission unless s/he succeeds in finishing the first mission. However the player is free to use the other section of the game for submitting stories at any time during the game.

The Overall Mood of the Game

Given that the players did not enjoy the story and the character, in the final version John is portrayed as a happy party loving person who had enjoyed his life in Manchester. In effect all the stories of the missions in the final version focuses on the good quality and positive aspects of the buildings and the places on the campus of University of Manchester.

Feedback Mechanism

To be able to hold the attention of the player to the game and to make the player feel in control of the game world some changes are made to the feedback mechanism. In the piloted version of the game, after completion of each mission a message was shown on the screen congratulating the player and the player was redirected to the page of missions with having the recently completed mission disabled. In this version of the game however after completing each mission based on the chosen response from the player (to either save the place in John’s memory as it is or to change it) the player is redirected to a page which shows how the John’s character is changing based on the player’s responses in the missions and it also shows how the response differs from other players. However this feedback is given once the mission is
complete. This is to make sure that the responses of other players will not affect the player's decision in the way the place is presented in John's memories.
Chapter 7

DISCUSSION

7.1. Introduction

This research aimed to critically examine the use of games in participatory planning practice and to identify opportunities for enhancing the use of games in the participatory planning field. To achieve this aim, the research sought to reach an epistemological understanding of digital games as a medium, core concepts of democracy, knowledge and power, and participatory planning tools and theories (Figure 7-1). Drawing on the outcomes of the Rigor (Chapter 3), Relevance (chapter 4) and Design phase (chapter 5 and 6), this chapter returns to the core themes posited in chapter one (section 1.3), reflecting on the ways it can be further developed and discussing the ways in which findings of the research can help us better understand the discussed interdependencies. To do so the chapter begins by discussing what games are and how they can be best conceptualized in participatory planning practices. In light of the findings of the design and play-testing process of the designed game, Mythoplastis, the chapter reflects on the limitations and added value of the proposed conceptualization of games (see section 3.6). The chapter then continues discussing the existing interdependencies between digital games, democracy and participatory planning. The chapter is concluded by presenting the revised conceptual framework.

7.2. Summary of the Key Themes and Discussions of the Research

The core themes of this research were introduced in section 1.3 of chapter 1. The underlying assumption is that innovative use and design of games can be achieved through understanding the sorts of knowledge that games can handle and produce, the nature of questions that are dealt with in participatory
planning practices and the sorts of knowledge that are taken for granted in shaping the democratic values.

To better understand the interdependencies (illustrated in Figure 7.1), the study explored what games really are (section 3.4), what kinds of knowledge they can handle and produce (section 3.6.1) and how the data flows between the real world and the imaginary world of games (section 3.6). In the relevance phase of this study the different roles of expert and lay knowledge in planning processes were explored (section 4.3). The design phase of the research (chapter 5) provided us with new insights on how the real world data and concerns of participatory planning can be incorporated into the design of the game world. In chapter 6, a better understanding of the perceived added values and implications of games for participatory planning was achieved through evaluating the first playable version of the designed game, Mythoplastis (chapter 6).

Having the results of the epistemic analysis in mind, in the following sections the existing interdependencies are discussed and elaborated. It is explained how the findings of this research can improve the theoretical and practical discussions on the use of games in participatory planning practice. Section 7.3 discusses how the findings of this research can help planners and game designers better understand games as a medium. It reflects on the existing and proposed definitions and conceptions of digital games and the ways in
which new conceptions of digital games can be achieved. Section 7.4 then discusses how the conception and use of digital games are affected by the current theories and tools of participatory planning and the sorts of knowledge that are taken for granted in these practices.

Section 7.5 outlines the possible implications of future practices of use of games for participatory planning. It is discussed how games can potentially influence the theories and tools of participatory planning by highlighting the importance of understanding an individual’s perceptions and behaviors (section 7.5.1), reconfiguring the author-user relationship in planning tools (section 7.5.2), redefining the role of planners or reshaping the perception of planners of their role (section 7.5.3), rethinking the role and nature of evidences in policy making processes (section 7.5.4) and finally exposing planners to a range of new ideas and fields (7.5.5). The added values of games for participatory planning practices are then summarized in section 7.5.6.

7.3. Digital Games; their Potential and Limitations as a Medium

Since 2001, when the formal study of games was first called for, a great deal of effort has been invested in defining and conceptualizing games and situating games historically in relation to other media such as literature, drama and cinema. A breadth of published and unpublished works exists on definition and conception of games in different gaming traditions and frameworks (Abt, 1970; Suit, 1978; Salen & Zimmerman, 2003; Koster, 2014; Juul, 2003; Cock, 2012). The majority of games that are designed to be used in planning practices (see section 3.3) follow the serious gaming tradition where games are conceptualize as systems. To better understand games as a medium, this research expanded the scope of the study to include a wide range of academic and non-academic works on digital games rather than solely focusing on the existing frameworks and practices of serious gaming. The study showed that the existing definitions and conceptions of games are often discussed in two main categories; games as an extension of play (Caillois, 1961) and games as systems with negotiable outcomes (Salen & Zimmerman, 2003); the former is mainly used by the mainstream game designers and the latter is the core
foundation of any study and practice on serious games and gamified systems. While the majority of the literature on philosophy of games acknowledge the terminological and theoretical ambiguity surrounding the concept of game (Mayer, 2009; Arjoranta, 2014), few studies have attempted to explain the reasons behind the multiplicity of game’s definitions and the reasons why certain definitions are more favourable than others in certain fields. The review of the existing and historical definitions of games in various gaming traditions and frameworks (section 3.2 and 3.4) provided us with a new insight on how a new conception of games can be achieved by understanding the root causes of the existing ambiguities and exploring the existing path dependencies.

7.3.1. On Definition and Conception of Games

The review of historic definition of games (section 3.2) in this study revealed that the existing terminological and theoretical ambiguities can be explained by the specific context in which serious games came into existence. The review showed a gradual transition of discussions about play as an end (Huizinga, 1964; Cailliois, 1961) before the 1970s to discussing games as tools with negotiable outcomes (i.e. a means to an end) during the 1970s (Abt, 1970; Suits, 1978; Avendon & Sutton Smith, 1981). A transition which was a product of rocketing success of video games and compelling failure of large scale models in addressing social complexities of plans at the end of the 1960s (Mayer, 2009). This transition led to the emergence of simulation, policy and serious games as tools with specific educational aims at their core. However the way the concept of games as a tool was acquired, structured and deployed in the 1970s imposed a certain practical implication for the use of games in fields such as urban planning, health care and education.

Influenced by the then dominant systems thinking and simulation trend in fields such as urban planning and policy making, certain validity measures were introduced for the use of games as research tools (Mayer, 2009). The introduced validity measures based on scientific frameworks conceived the notion of use of games as educational tools and systems with simulated environments as research tools. In effect, definitive approaches to defining games (the idea of defining games based on their core elements) gained momentum (Arjoranta, 2014). Given the lack of studies on how games can adapt to the new requirements of participatory planning, the definitive approaches con-
continued to be used as the main approach in the study of the use of games in scientific fields.

The findings of the Rigor phase of this research however revealed the relevance of descriptive approaches to defining games in discussing the use of games as tools in participatory planning. The outcomes of the study suggest that games can best be described as tools with multiple affordances. According to Creem-Regehr and Lee (2005: 457) a tool with multiple affordances "usually has one specific use that is associated with its identity ... a functional specificity that distinguishes it from other types of objects." This functional specificity however in the case of digital games very much depends on the context in which the game is being used in and the availability and defined functional specificity of other tools in that context. For example, in the planning field nowadays games are being advertised as great educational tools while in advertisement and business studies games are known to be a great research tool for studies on the behavioural economy. Given the importance of the context in the way games are conceptualized, a better recognition of descriptive approaches to defining games is needed in serious gaming frameworks.

The outcomes of the study shows that there are three main acknowledged affordances for digital games in scientific and non-scientific fields; 1) games are great educational tools as they can provide conditional access to the content through monitoring the mental model of the players and updating it (Koster 2013); 2) they are very powerful tools for capturing the tacit knowledge of the players as the changes in the mental model of the players and the players’ actions can be recorded (Cook, 2012). 3) They are very engaging and fun as they can provide immersive experiences for the players using the elements of make-believe and detaching the game world from the real world (Salen & Zimmerman, 2004; Huizinga, 1964; Juul, 2010).

7.3.2. The Added Value of the Conception of Games as Artefacts with Embedded Information Systems

To better situate games in participatory planning practices, a conception of games as artefacts with embedded information systems was proposed in this study. The study argued that the introduced framework can better explain the flow of data between real world and imaginary world of games and the
ways in which the different components of the games can make use of the incorporated data. This conception is descriptive in nature and is not aiming at defining games by listing their necessary elements rather it provides designers with an overall structure and approach for analysing and designing games in different contexts. In the design phase of this research, the conception of games as artefacts with embedded information systems proved to have a number of advantages:

Its focus on explaining the possible use of games in specific context by understanding the flow of the data rather than the specific characteristics of the context in which the game is being used, the framework can be used for analysing the potential use of games in various contexts and fields from mainstream game design to study of the gamified systems; the proposed framework, in effect, can be used to study the possibility of the use of games for specific purposes and outlining the ways in which the components of games can be tailored to specific uses.

In the design process of this research, the conception of games as artefacts with embedded information systems proved to be helpful in bridging the gap between the serious game design frameworks and mainstream game design frameworks; the issue that is highlighted in various studies in the field of gaming (Arojanta, 2014, Koster, 2013). In the design phase this conception enabled the designer to make use of a set of available tools and techniques that until now have been only inwardly used in specific contexts and gaming traditions. This proved to be beneficial in addressing the failure of serious games in providing a good user experience. Serious games are often criticized for their lack of playfulness and failing in providing a good user experience (Breuer & Bente, 2010; Ritterfeld, Cody, & Vorderer, 2009).

Furthermore by focusing on the ways in which data flows between real world and imaginary world of games, the framework can be used to analyse and study the use of systems with various degrees of virtuality. As a result, the framework is relevant for analysing the virtual reality, augmented reality and mixed reality games as well. As discussed in section 3.4 of chapter three, one of the main drawbacks in the use of definitive frameworks in defining games in a serious game design framework is that the conceptions often lose their relevance when new technologies or genres of games emerge (Juul, 2003). On the other hand the descriptive approaches do not provide the designers with
a framework based on which new games can be designed (Arojanta, 2014). In this sense, the conception of games as artefacts with embedded information systems can contribute to both discussions on descriptive approaches to the study of games and serious games design frameworks.

7.4. Current Conception of Democracy in Participatory Planning Practices and the Use of Games

A growing number of studies in planning are addressing the role and added value of games in participatory planning practices as discussed in chapter three (see for example Poplin, 2014; Alfrink, 2015; Palazzi et al, 2010). More often than not these efforts focus on understanding the many ways games can be used in participatory planning processes for fostering democratic values; in particular, these studies highlight the power of playful activities in boosting the sense of community and facilitating the collaborative decision making processes. The findings of the rigor, relevance and design phases of this research reveal that the interdependencies between the games as medium and current conceptions of democracy in participatory planning practices are way more complex than how they are depicted in the current studies of use of games in participatory planning practices.

7.4.1. Reflection of Democratic Values in Digital Games

Game designers are not alien to the discussions on how human values are reflected in the structure and content of a game. As Flanagan and Nissenbaum (2014:1) point out “all games express and embody human values, providing a compelling arena in which we play out beliefs and ideas. ‘Big ideas’ such as justice, equity, honesty, and cooperation—as well as other kinds of ideas, including violence, exploitation, and greed—may emerge in games whether designers intend them or not.” Going through the process of designing a game and defining its specifications provided new insights on the ways democratic values are reflected in the design and use of digital games. The discussed game design frameworks, Cook's (2012) and Schell's elemental tetrad (2014), in particular, were very helpful in understanding the complex nature of this representation.

The design process in this research showed that the choice of technology, genre and aesthetics of the game can significantly change the audience of the
game. Studies (see for example Norris, 2001; Selwyn, 2004) have been done on whether, where, and how digital technologies create and facilitate new opportunities for the disempowered on the one hand, and deepen the established social, economic divisions on the other hand. This is specifically crucial in discussing ’gaming literacy’; a concept which was introduced by Zimmerman in 2009 to highlight the need for new kinds of literacy in the information age given the growing use of computer and communication networks. He argues that although literacy and media literacy are necessary in the 21st century, they are not sufficient for one to be “fully literate” (Zimmerman, 2009: 23). He argues that “gaming literacy is one approach to addressing these new sorts of literacies that will become increasingly crucial for work, play, education, and citizenship in the coming century” (Zimmerman, 2009: 24). In this sense a better recognition of the importance of the right choice of technology becomes crucial in design of serious games in participatory planning practices.

Besides technology, the choice of aesthetic of the game can also influence the success of the game in fostering democratic values (Schell, 2014). The storyline of game is conveyed through the use of aesthetic elements in the game. This included text, graphics, colours and symbols. Several studies (Bolton 2016; Greenfield 2014) have highlighted the effects of the languages available on digital platforms on the marketing and the growth of the gaming industry in different parts of the world. The main premise in these arguments is that not only the game design industry pushes the designers to use English as the main language of their games, but also the lack of technical capacity of digital technologies in dealing with different languages limits the use of language in the design of games. Therefore the use of symbols, graphics and texts in digital games for conveying the game’s story can significantly change the audience of the game and consequently the involved groups in the participatory planning practices. This is in-line with Davoudi’s (2015:326) argument that “the symbols (such as diagrams and charts) that planners use to represent the city complement their political representation of which groups represent urban society.” In discussions covering the use of games in participatory planning, there is a lot of emphasis on how games can foster democratic values through boosting the sense of community. However, the representation of the current conceptions of democracy with all its deficiencies is often ignored.
7.4.2. Current Conception of Democracy and the Limited Use of Games

The perceived components of the ideal democratic system not only affect the construct of the game and its overall game world, but also influence the use of them in participatory planning contexts (see section 4.5). The review of the existing conceptions of democracy in participatory planning frameworks in this study revealed that the rationality and knowledge that are taken for granted have historically shaped the conception of democracy and consequently the validity of knowledge produced through using different means. The knowledge produced by games is not an exception. In the Rigor phase of the study it was discussed that digital games can mainly be used for capturing and recording the tacit knowledge of its players. Given the introduced validity measure based on scientific rationality, in the current practice of use of games in planning practices, the games often are designed as simulations to make it possible to translate the actions of the player in the game world to the real world and the tacit knowledge that is produced during the game is often ignored.

The review of existing participatory planning frameworks revealed that despite the efforts to make planning practices more democratic and taking into account different sort of knowledge, the postmodern conceptions of democracy and planning have not yet managed to distance themselves from the rationalist view of the modernity (Mazumdar, 1992). This mismatch between the ideals of planners and the actual practice of planning was explained to be the result of the context in which planning was formed as a profession (section 4.5); emphasizing the idea of experts and Representative democracy.

The possibility of use of direct democracy concepts was also explored in this study (section 4.4). It was discussed that the existence of demos (a group of people with a shared concern) is crucial in meeting the democratic ideals (Tironi, 2013); the factor that is often ignored in the current participatory planning practices (Leino & Laine, 2012). The creation of matters of concerns is often seen as a secondary outcome of the communicative planning practices (Innes & Booher, 1999) rather than its prerequisite. In the creation of demos then understanding and capturing the individual’s perceptions becomes crucial.
7.5. Digital Games and the Future of Participatory Planning Practices

Like any other forms of media, digital games not only get influenced by the context in which they are being used but also they influence certain elements of that context. The epistemic analysis of games in this study has made the discussions on possible contributions of digital games to the future of participatory planning possible.

7.5.1. New Media and Reconfiguring the Author-User Relationship in Planning Tools

As mentioned in the introduction of this research, New Media, including digital games, are often praised as technologies that have blurred the lines between producers and consumers of the media through revolutionizing and facilitating the interactivity among users or between users and information (Lister, 2009; Rice, 2007). However New Media has now a umbrella concept for describing a constellation of digital interactive systems. A number of studies have been done on validating these claims for specific mediums such as web 2.0 technologies (Dahlgren, 2013; Viitanen and Kingston, 2014) and social media (Kellner & Share, 2007). However very limited studies in game design have touch upon this subject. The findings of this study however give us new insights on the validity of these claims.

The study shows that contrary to other New Media, digital games do have a strict control over the content (Cook, 2012). As shown in Cook's game design model (section 3.6), a mental model of the player is validated and updated in each loop to make sure that the mental model of the player matches the designed logic of the game world. Even in the case of open ended massively multi-player online games the logic of the game world controls the flow of the story and the events that happen in the game world. In this sense, an 'ideal logic' (defined by the game designer) dominates the game world at all time, regardless of the genre and type of the game. In this sense, the player does not have much control over the content of the game as a medium and the interactivity between users and the provided information in games is not very different from traditional forms of media and author-user relationship in games cannot be defined by 'New Media' frameworks.
Although games have not significantly changed the author-user relationship, the use of games in planning brings up discussions on who the users of these tools really are in participatory planning practices. For decades, a great deal of efforts has been invested in devising tools, known as Planning Support Systems (PSS) which help planners fulfil their tasks. Over the past decades the effort in the use of New Media in planning is focused on how different capabilities of new technologies can be incorporated into the design of PSS. Other trends such as SoftGIS (Kahila & Kyttä, 2009), Citizen science and data art try to bridge this gap by reducing the complexity of PSS to make them more usable for the general public. It has not been until recently that planners have started to explore the possibility of the use of data that is already produced in New Media. The potential of analysing Twitter's data (Batty, Michael, et al., 2015), narrative analysis of Facebook posts and comments and analysing geo-tagged images in Instagram are now increasingly being explored in planning practices. More and more planners are exploring data that are not gathered using tools which are specifically tailored for the use of planners. In this sense, new media is introducing tools in planning which have multiple affordances; they can be used by communities for communication purposes and by planners for analysis and research purposes.

**7.5.2. New Trends in Game Design and New Conceptions of Democracy**

The use of games in participatory planning practices is not just the challenge of adapting things like genres, plots, characters, themes, audiences, and ideologies but also of recreating one media within the social and technological affordance of another (Sandercock, 2012). For this recreation in the face of fast growing technological advancements it is crucial for planners in participatory planning to familiarize themselves with new trends and technologies and to study their possible implications for conceptions of democracy and planning frameworks.

Two trends in game design can potentially change the production and use of knowledge and consequently the conception of democracy; adaptive game design (Spronck et al. 2006) and mixed-reality storytelling (Pan et al. 2006; Bayon et al. 2003). With the advances in technology and increasing interest in Big Data, a new trend is emerging in the use of new media which aims to provide personalized experience of the media for each user. Games are not an
exception. A group of game design scholars have started exploring the concept of the 'adaptive game'; games that personalized the game experience to the player’s skills, desires and characteristics. This is on the one hand the result of great advances in technological capacities of games, and on the other hand is the result of incorporating more artistic values in the design of contemporary tools.

New Media has already started to provide individuals with platforms through which individuals can express their stories, ideas, etc. It has also to a great extent changed the way knowledge is transferred and acquired (Elwood & Leszczynski 2013; Murray & Peyrefitte 2007). This has opened up opportunities for the public to be exposed to a great deal of tacit knowledge of other people. This increasing emphasis on know-how knowledge has questioned the legitimacy and validity of information from traditionally known media and sources (Jenkins 2006). This is changing the types of knowledge that are taken for granted and it is decreasing the legitimacy of scientific frameworks which in turn will change Democratic values in the future.

The other trend is the use of technology for creating mixed-reality game environments. In the 21st century, the technological advances powering virtual worlds are becoming more and more accessible to the general public; technologies that make virtual experiences more immersive and sensory-satisfying (Blascovich & Bailenson, 2011) to the point that it is hard for the user to recognize where reality ends and the virtual starts. The concepts of reality and virtuality are not something new; science fiction and other forms of literature have long dealt with these two concepts. The difference in the 21st century is that the imagined worlds are not anymore bound to the paper or the mind of the reader, rather the consumers of that media can now experience the imagined world; it is through this experience that new knowledge is produced.

7.5.3. Rethinking the nature and the Role of Evidence in Policy Making Processes

In the relevance phase of this research (section 4.6) the role of evidence in the England’s planning system was discussed. It was argued that this reliance on evidence-based planning limits the use of New Media such digital games. Many studies have been carried out on the role and validity of evidence in
planning processes (Davoudi, 2006; Krizek et al., 2010). The findings of this study reaffirm the need to move beyond the rationalist validity measures in planning practices.

The questioning of the validity of scientific measures is to some extent the result of the shift from knows-what paradigms of thinking to know-how. With the increasing use of New Media and the emergence of new tools for transferring knowledge, people are doing and learning skills which were once considered as profession. This shift has also been reflected in new conceptions of planning and the role of planners; a recent case can be found in a paper of Davoudi (2015) which conceptualizes planning as a ‘practice of knowing’.

If games are to be used in participatory planning as a tool for gathering knowledge, it should become clear for the planners how the resultant information can be incorporated into the planning decision making processes. When disciplines depart from scientific validities and frameworks the role of perception becomes crucial; without a universal truth (scientific validity) the practice of planning will rely on the individual and collective perception of the role of planners and the usefulness of different tools. In this sense with the increasing interest in exploring the non-scientific sides of planning, the study of the role and the perception of the role of planners should be prioritized.

### 7.5.4. The Role and Perception of the Role of Planners

In 1972, Wildavsky once wrote "planners can no longer define a role for themselves. From old American cities to British new towns, from the richest countries to the poorest, planners have difficulty in explaining who they are and what they should be expected to do". 45 years on and still this statement remains valid. In the proposed conceptual framework the components of the participatory planning practices that were taken into account were theories and tools. The assumption was that the role of planners is mainly covered in the participatory planning theories and therefore through epistemic analysis of participatory planning the role of the planners also could have been included.

However in the course of interviews it was observed that it is not only the theoretical definition of the role of planners that validates a tool for being used in planning processes, but also more importantly it is the perception of
the planners (students and practitioners) of what they do and how it should be done. Acknowledging the lack of studies on planner’s self-perception, a number of studies (see for example Fox-Rogers, 2015; Dobruka, 2015) have been carried out in the past years on how planners perceive their tasks and goals. According to Dalton (2015), “often, discussions about planning’s identity become defensive, resisting the “intrusion” of other professions, politicians, and even the public into “our” realm”. The conducted interviews in this research showed similar results.

7.5.5. Added Value of Games for Participatory Planning Practices

All in all do games have added value for planning? Games as a medium are still one of the most powerful tools for educational purposes (Cannon-Bowers et al. 2011). However the power of the games in capturing and controlling the mental model of its players is still very much unexplored. One of the unique qualities of games is that since it has so many embedded systems (such as story, technology and mechanics) it is possible to end up with very different games using the same concept. This will be very useful in performing comparative studies.

It is also important to note that not all the games are very easy and cheap to make (Arakji & Lang 2007; Shankar & Bayus 2003). For example, the design of the role playing game can exceed more than the whole budget of the neighbourhood plan for that neighbourhood. Adding to this it was argued that as an art form the outcomes of the game might not be as well as what the planner hopes for. However a good design and a thoughtful process of determining the game’s specifications can make the digital games cheaper and therefore less risky for planners to use.

Although the direct added value of games in participatory planning might be open to discussion, it is of no doubt that the increasing studies on games and use of games in participatory planning will opens opportunities for planners to interact with more artistic fields. The use of games in planning is one of the first tools which were purely designed for its artistic value but that they are being framed within the scientific frameworks of planning. Even if games will not make it to the planning toolboxes in practice, the fact that they makes
planners more aware of other existing approaches can be argued as one of their unique added values.

7.6. The Revised Conceptual Framework

The revised version of conceptual framework in this section illustrates the interdependencies between concepts of participatory planning, digital games and democracy. It shows how the conception of games as artefacts with embedded information systems was proven to be useful in understanding the flow of data between real world and imaginary world of games. Various types of data (such as everyday life stories, real-time data, values and perception, statistics and quantitative data) can be used to construct the game world and its rules (see section 3.6). The participatory planning concerns which are shaped by the dominant conception of democracy also influence the game world through determining the values that are reflected in the rules and the game world and the ways in which players interact with each other.

However, the study revealed that the types of knowledge that are produced through the game are to a great extent limited to the designer’s notions of democracy and the notions of participation that are taken for granted. When games are to be used in practices that follow communicative planning principles, a set of scientific validity measures are introduced which limits the ways in which the game world can be constructed. The game world in this case should be designed very close to reality. As a result the produced knowledge in the game will be limited to the player’s behaviours in a simulated environment. If the game is designed with agonistic planning principles in mind, the captured behaviours/perceptions of the players in the game can be used for creation or identification of demos which is closer to the ideals of direct democracy. The game world in this case is not necessarily a simulated environment. Rather, various types of rules and immersion techniques (section 5.2.2) can be used to construct the game world.
The outcomes of the playtesting sessions in this study showed the importance role of a factor which is often ignored in discussions of participatory planning; the perception of the planners from the ideals of communicative and agonistic planning approaches. In the cases of serious games, they are not the defined ideals of communicative planning and agonistic planning approaches that shape the validity measures. Rather, it the perceived ideal of these approaches by an individual planner that plays a crucial part in defining a validity of a game in participatory planning practices. The revised framework provides planners with an insight into how the choices throughout the design stages of games can limit the types of knowledge that can be gained through using games in participatory planning practices.

Figure 7-2: Revised Conceptual Framework
Chapter 8

CONCLUSION

8.1. Introduction

This chapter recaps the aim and objectives of the research and briefly explains how they have been met. The chapter begins by providing a brief summary of the research objectives and the key findings of the research. By reflecting on the findings of the research, the key contributions of the study are then outlined. It is explained how the research contributes to the existing discussions on the use of games in participatory planning practices. The chapter continues by discussing the areas for future research. It is discussed how the limitations of the research can be addressed in future studies and how the findings of the study can be used to further develop frameworks for the use of games in participatory planning practices. The chapter is concluded by providing a reflection on the overall process of the research and discussing the lessons learnt.

8.2. Research Objectives and Key Findings

This research aimed to critically examine the use of games in participatory planning practice and to identify opportunities for enhancing the use of games in the participatory planning field. To do so, as its first objective, it sought to understand the potential and limitations of digital games as a medium. To better understand how games are defined and used in different game design trends, a wide range of literature from gamification, mainstream and serious game design fields were reviewed. The results of the review showed that games are often studied as tools with multiple affordances; i.e.
each field and game design trend assigns a specific conception to games that highlights those qualities of games which are of use in that specific context. This context-specific conception without having an overarching framework to understand games has resulted in terminological and theoretical ambiguity surrounding games. The analysis of the differences between the conception of games in different fields and trends suggested that the key to moving beyond the use of a context-specific conception of games is in reaching an epistemological understanding of the games by understanding the flow of knowledge between real world and imaginary world of games. Games were discussed to have one quality that makes them different from other New Media; they can provide gradual content through monitoring and updating the mental model of their players.

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<td>To understand the potential and limitations of digital games as a medium</td>
<td>Games are great educational tools as they can provide conditional access to the content through monitoring the mental model of the players and updating it. They are very powerful tools for capturing the tacit knowledge of the players as the changes in the mental model of the players and the players' actions can be recorded. They are very engaging and fun as they can provide immersive experiences for the players using the elements of make-believe and detaching the game world from the real world.</td>
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To better understand how games can be best situated in participatory planning practices, and to achieve the second objective, the current practices of use of the games in participatory planning were reviewed. The games which are now being used in planning practices were put in the three main categories; games about planning (section 3.3.1) which are mainly designed for entertainment purposes but do have planning as their main topic, games for planning issues (section 3.3.2) which are specifically designed to be used in planning practices and finally games that use the city as their game board (section 3.3.3). The review games in the 'games for planning' category showed that the majority of the designed games in this category are used to
educate the players about the complex nature of the decision making processes in planning. To better understand why games are rarely used for capturing rather than conveying knowledge, historic use of games in planning practices were reviewed. The review revealed the existing path dependency in the case of the use of games as a research tool in participatory planning practices. The results of the review of the historic use of games in planning highlighted the ignored influence of systems thinking and large scale modelling trend of the 1970s on current conception of games in planning. It was argued that the lasting legacy of gaming and simulation of the 1970s and the emphasis on the scientific validity measures cease planners to be open or receptive to the artistic values of digital games and their potential in being used as research tools.

To better understand the underlying reasons behind the emphasis on scientific validity measures, the existing conceptions of democracy in participatory planning and the nature of questions that are being asked in participatory planning were reviewed.

The result of the analysis (section 4.3) showed that the historic context in which planning emerged as a field has influenced the ways in which the role of planners and the public and consequently the concept of democracy is defined. The review revealed that although the added values of capturing and using tacit knowledge of the public are often trumpeted in the participatory planning literature, the complexity of the approaches to capture tacit knowledge of the public and the high reliance of the field on rational processes and scientific approaches to social change has limited the use of tacit knowledge in participatory planning processes.

It was argued that the departure from scientific frameworks for planning will bring up discussions on the role of individuals’ perception in the conception of democracy. In section 4.2 it was discussed how the capturing and understanding individuals' tacit knowledge will bring us closer to direct forms of democracy in planning practices. The lack of tools for capturing the individual's tacit knowledge and methods to process it, are often discussed as limitations of participatory planning practices. It was concluded that given the power of games in dealing with mental model of its players, games can be best used in participatory planning for capturing the mental model, perceptions and behaviours of the users.
OBJECTIVE | FINDING
--- | ---
To understand the bottlenecks and deficiencies of current practices in the use of digital games in participatory planning practices | The current practice of gaming in the planning context is limited to the frameworks of Simulation and Gaming tradition. Although the added values of capturing and using tacit knowledge of the public are often trumpeted in the participatory planning literature, the complexity of the approaches to capture tacit knowledge of the public and the high reliance of the field on rational processes and scientific approaches to social change has limited the use of tacit knowledge in participatory planning processes.

To better situate digital games in the participatory planning toolbox and as part of the third objective of this research, a new framework for the study and design of games as a research tool was devised. To better understand the in-between spaces of reality and virtuality, games were conceptualized as artefacts with embedded information systems. Using the Cook's (2012) game design framework the suggested framework showed how the real world data can be incorporated in different parts of the game; in creating the overall game world, in the rules and mechanics of the game, in its spatial quality and visual quality or in its story.

To achieve the fourth objective of this study a game called Mythoplastis was designed, developed and tested using the proposed framework. The main aim of the design was to check how the historic and statistic facts about different locations in a neighbourhood can be abstracted or represented in the game world in a way that the distinction between the real world and the imaginary
world of games is ensured. It was also important to test in the design how the actions or mental model of the players can be captured to identify the places that the public care about the most in the study area.

The design process showed that focusing on the flow of the data between the real world and the imaginary world of games help the designers to bridge the gap between the serious game design and mainstream game design frameworks; making games that not only can be used to collect data but that are providing the user with a good user experience. The proposed framework also opens up the serious games design to a rich range of storytelling techniques and tools that are now solely being used in mainstream game design.

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<td>To test the devised framework by designing, developing, and implementing a game that can be used for research purposes in participatory planning practices</td>
<td>Mythoplastis (an online game) was designed, developed and implemented as a tool for identifying/ creating the matters of concern in a neighbourhood scale.</td>
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To achieve the final objective of this study the success of the game in addressing the design problems was evaluated. The game play of the game was assessed using expert-based evaluation methods and the success of the game in providing a good user experience was evaluated through arranging a play-testing session and using questionnaires. Despite the shortcomings of the first playable version of Mythoplastis, the evaluations revealed that with a more thoughtful level design of the game and the contribution of the professional game designers the game can achieve the design goals and that the design of a game which can be used as research tool while being fun is not something which is not imaginable and indeed implementable.

The results of the theoretical and practical parts of the research show that the added value of games for participatory planning is not limited to the capacities of the game as a tool; despite their power in educating the users and capturing the mental model of its players, games are very expensive tools to make and the level of certainty in their outcome can be quite limited. However the pervasiveness of games in planning practices will help planners better communicate with the art fields and this will provide the opportunities for
the planners to redefine their role, their task and to redefine planning based on artistic values.

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<td>To reflect on the potential and limitations of the framework and possible future improvements</td>
<td>Conceptualizing games as artefacts with embedded information systems was shown to be very helpful in situating games in planning toolbox. However game designers and planners can benefit from studies on the constructs of imaginary worlds and redefining the role of planners.</td>
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8.3. Research Key Contributions

This research expands the theoretical and practical discussions on the study of games in number of ways:

**Bridging the gap between the Mainstream Game Design and Serious Game Design Frameworks**

When the formal studies of games were called for in 2001, the vision was set as unifying the works that scholars from different disciplines were doing about games and playful activities (Frasca, 1999). The rigorous review of the existing literature on games in this study however revealed a rather different actualization of that vision. The study revealed the extent of the 'silo effect' (Tett, 2015) in the formal study of games; with each game design trend (mainstream, gamification and serious game design) being isolated in their own little part of the community and experiencing minimal interaction with each other.

With the increasing number of academic studies on games, the game design trends have managed to set their foundations (defining their frameworks, theories and tools). However each trend is getting inwardly focused on a narrow range of topics and design frameworks, drawing academics in serious game design, gamification and mainstream game designers into competition which ultimately results in widening the gap between different trends; cases like serious game designers attacking gamification academics by calling the trend 'bullshit' and 'exploitationware' (Bogost, 2011) or serious game de-
signers calling the mainstream game designs useless. The existing rigid boundaries of frameworks for the study of games in specific contexts constitute a barrier to intellectual progress in the formal study of games. The lack of overarching frameworks for the study of games, the limited studies of the philosophy of games and a lack of cross-cutting research in this field are just a number of underlying reasons for this widening gap between different game design frameworks.

In an effort to bridge the gap between the mainstream game design and serious game design frameworks this research made use of a wide range of literature across the three existing game design trends. Through the conception of games as artefact with embedded information systems the study showed how the overarching frameworks in game design can be used to achieve a better design for serious games. The design process of this research also benefited from bridging this gap. The outcomes of the design process of this research showed how serious game designers can benefit from a wide range of already existing tools, techniques and approaches to create innovative games for research purposes.

**Study of the path dependencies**

The history of games in general and video games and board games in particular have extensively been studied by several scholars as discussed in chapter three. There exists a breadth of literature, documentaries and documents on how these games came into existence. The policy games and the use of games for strategic decision making and serious games also benefits from a rich body of literature on their history. However very limited studies have attempted to understand how these historic events of gaming are now affecting the way games are being used in academic fields.

The understanding of this path dependency is specifically crucial in the case of the use of games in planning practices as the very early conception of serious games were introduced for planning issues. The formal study and acknowledging the existence of these path dependencies will lead us to a better conception of games in different fields. Acknowledging the specific context in which the conception of games as research tools were introduced can provide us with insight into points of departure from the old context. It is crucial to understand what elements of that specific context influenced the process and how the changes in those elements can be understood over time. In the
case of this study we focused on the role of changes in the knowledge that was taken for granted however other factors of that historic context can be analysed to achieve new understandings of how games work in certain contexts.

**Moving beyond studying what is done towards understanding what can potentially be done**

Very limited studies are done on the use of games in planning practices. The majority of these studies are mainly focused on reporting and analysing (Poplin, 2010) the current practices in this field. The results of our research reveal the extent to which the lack of philosophical studies on games is affecting the current use and the future use of games in different contexts. In order to devise a prescriptive framework for game design in participatory planning rather than a descriptive one, this research focused on reaching the epistemic understanding of games. The conception of games as artefacts with embedded information systems provided us with opportunities to define what can potentially be done in the design of serious games.

The study also revealed the importance of expanding the scope of studies in the planning field on the use of different media. Very often than not the studies on the use of tools and media in the planning field are focused on how different elements of a tool can be incorporated into the design of PSS. This research however highlighted the importance of exploring how the planning field can be influenced or redefined as a result of the adoption of new tools. The study showed that new approaches can be introduced in planning practices if planners become more receptive to changes in the current structures of planning.

**Design Process and the specification of Mythoplastis**

A mix of mainstream game design and serious game design frameworks were used in the design process of Mythoplastis. The idea of introducing game principles to the development lifecycle was an effort to add an element to mainstream game design frameworks in which the context-specific concerns of serious games can be addressed. The idea of breaking down the design space to design principles makes it easier for serious game designers to see how the ideals of different aspects of the design can be put together to define the so-called design space (i.e. solutions space).
The format and specifications of Mythoplastis is an artefact contribution of this research. The final specifications can be adopted and tailored to different contexts to capture the matters of concern of the public in different places. Depending on the context in which the game will be used, different specifications of the game can be modified to better fit the game to the specific purpose of the project at hand. For example, the combination of the story and mechanics of the game can be used for designing a game with a similar purpose on a different platform.

8.4. Areas for Future Research

The research on which the thesis reports was exploratory in nature and was limited in certain resources, and as such a number of potential areas are outlined in this section on which future research could focus. This research was mainly focused on understanding how the specifications of the game can be defined for a game to be useful as research tool in participatory planning practices. However the limitations on time and resources, cease the researcher to test the game in a real participatory planning case. Testing the game in a real case of participatory planning would have provide us with a better insight into the quality and quantity of the data which is collected using games, the ways in which the resultant data can be incorporated into a real process of participatory planning, and the degree of success of the game in providing a good user experience. It is crucial to note that certain modifications are needed to tailor the existing specifications and storyline to the specific context in which the game will be tested.

In the design of Mythoplastis we only focused on the use of historic data and stories about the buildings. The aim was to explore how this information can be abstracted/represented in the game world. As shown in Figure 7-2 other types of data also can be used in the construction of the game world. The game rules can be backed up by complex urban models, the game environment can be constructed using real time data (like traffic or the weather data). With further research on how these data can be incorporated into the game world, new horizons can be explored for the use of games in planning practices. On the other hand, in this study we focused on the participatory planning practices, however the devised framework which helps planners
and game designers in understanding the flow of data between the game and the real world, can be used to study the potential of games in other areas of planning as well.

The mental model of the player in Mythroplastis was captured through providing the player with two choices; either to save the building in John's memory or to change it. However depending on the aim of the study and the nature of data, much more complex mechanisms can be used to capture player's behaviours, perceptions and belief. Creating heat maps and the use of automated systems for tracking the movements of the player within the game world and a more complex story setting can be used to better understand the behaviour of the player in the game world.

The approach taken in this research for the study of the added value of a medium such as games through understanding the ways in which data flow happens between the real world and the imaginary worlds can be used to study other mediums with imaginary world constructs as well. In the past decade, mediums which work with or enable virtual reality and mixed reality environments have gained momentum. The pervasiveness of these technologies can potentially have serious implications for the urban spaces and spatiality of cities. The use of approaches as the one taken in this study help the planners to have a better and prompt response to technological advancements.

The framework also makes it possible for future research to explore the construct of imaginary worlds. It is worthwhile to study how different fields such as literature, planning, cinematography, painters and musicians construct and represent their imagined world; what aspects of the content and construct of the imagined world is influenced by the limitations of the medium that is used in those fields and what aspects get influenced by the believes, theories and perception of the professionals about their tools and capabilities in the profession in question.

Given the importance of the distinction between the art and science approach to social change in much more broader conceptual studies it would be interesting for the planners to explore how planning as a profession can be redefined based on art philosophy.
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Appendix A:
Access Link to the Source Code of Mythoplastis

The source code of the first and the second version of Mythoplastis are all accessible on https://github.com/moozhan/Mythoplastis-V1.0