Data-Driven Games and Environmental Storytelling; Moving Beyond 'Simulation and Gaming' Tradition

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Abstract

Despite the advances in technology and emergence of new virtual and augmented reality game development platforms, it is still arguable whether or not the game-based modelling approaches have explored and exploited the full potential of game design techniques and game world development. In this paper two games that were designed and analysed are introduced. The design process of these two games shows how the better understanding of games as a medium and making use of make-believe and environmental storytelling techniques, can lead to user-friendlier and more meaningful simulations in urban planning context.

Keywords: Digital Game, Environmental Storytelling, Data

1. Introduction

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 complexities, 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 and Stoll, 1972, Mayer, 2009); digital games could not only be used to perform experiments without interfering with real-life systems, but also were considered to be a safe learning environment. They were believed to be able to facilitate the exchange of knowledge between the experts and the public (Klabbers, 2009). 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.

This conference and its outcomes left their mark on the way games were and are being used in contexts other than pure entertainment. The use of games for pedagogic and communication purposes in serious contexts was already tried-and-tested case (Mayer, 2009). However the use of games for research purposes was not yet explored to that date. 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: 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). Building on the findings of this conference, Duke (1974, 1980), Meier (Meier and

Duke, 1966) and Feldt (1995) published extensively on the ways simulation games can be used in different contexts.

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 element of gaming to predictable outcomes (Liebe, 2008). This shift had several implications for simulation game design. With the value of gaming for contexts other than pure entertainment being measured "*against the criteria of the analytical and positivist sciences-theory based, valid predictive and so forth*" (Mayer, 2009, p. 831), new validity measures were introduced for games (Peters et al., 1998). With these measures in place the resemblance of the game world to the real world became crucial. There was a general consensus was that "*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*" (Raser, 1969).

Although the introduced validity measures in 1970s are still valid for game-based modelling practices today, the modelling experts have not yet managed to distance themselves from the highly-simulation related design approaches of 1970s. With the urge of game-based modellers to create highly simulated environments, the new VR and AR technologies and game development platforms such as Unity are used to create replica of the real word environments; not only in their spatial and physical qualities but also in their logic and mental model. Very often with the emphasis on the seriousness of these game environments and the focus on the desired outcomes, the user experience principles are overlooked. This has led to a big divide between the serious games focusing on the reality and seriousness and mainstream game design practices focusing on user experience principles and ensuring the fun elements of the game. In particular, in the mainstream game design practices, new approaches to make-believe such as environmental storytelling are being used for constructing narratives and game worlds which are not similar to real world but contains various types of data. 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*." In this paper it is argued how serious game design and game-based simulations can benefit from these techniques to bridge the gap between serious game and mainstream game design and to enhance user experience while accommodating for the scientific validity measures.

2. Methodology

The overarching research strategy adapted in this study used the Design Science Research (DSR) paradigm. DSR focuses on creation of new knowledge and analysis of the use and performance of an artefact with creation and testing that artefact. 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 (Venable, 2006). Two games were designed in two different contexts, both following the three-cycled DSR (rigor cycle, relevance cycle and design cycle) model introduced by Hevner (2007). The Rigor Cycle connects the design science activities with the knowledge base of scientific foundations, experience, and expertise that informs the research project. The Relevance cycle then deals with understanding the contextual environment and activities of the research projects and 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. The main aim in both games was to explore how the data flows between the real world and the game world and how the game world can be constructed using make-believe and environmental storytelling techniques (Figure 1).

The first game, Mythoplastis, was designed to capture matters of concern in a neighbourhood. The game was developed at University of Manchester and was tested in the university campus. In this game the focus was on world building through narrative. The historic facts and statistical data from the campus was used to construct the narrative of the game however the spatial qualities of the real world was replicated in the game world. In this game number of fiction storytelling techniques were used to feed the real world data into the narrative of the game. In this game, the player is asked to help the medical team in recovering the memory of a guy called John who has been born and raised in Manchester by putting together the given clues and finding out the location that John memory took place. They are then given the option to keep the memory and the location as it is or to change it the way they want John to remember it. The choice of the player to keep/change the place is then captured and mapped. In the second game, MetalKong[1], the focus was on using the real world data in constructing the visual elements of the game environment as well as the narrative. MetalKong was designed to capture the value that the public assign to each building in their neighbourhoods as well as educating them about the circular economy concepts and the value of existing metals in the old and new buildings. Using the same approach in this game also the actions of the players in a fictional story world are captured.

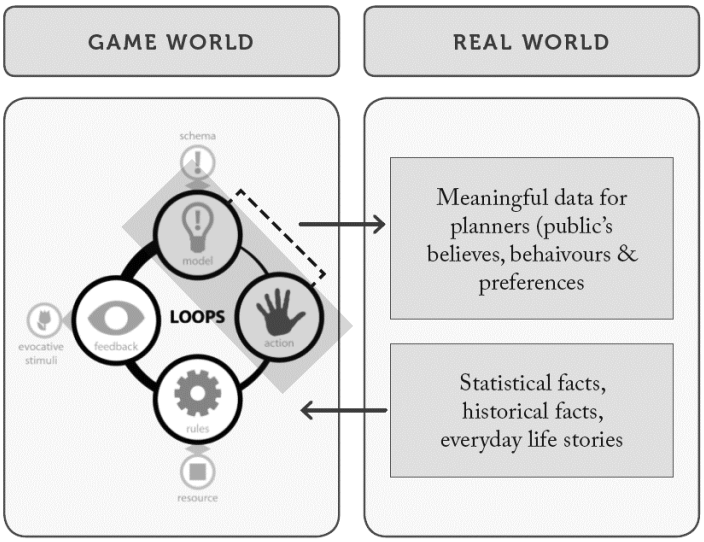

Figure 1: Design Problem

3. Key Findings

The design of both games, Mythoplastis and MetaKong, shows how the mix of narrative architecture, simulation, game design principles and serious game design principles can be used to

[1] MetalKong was designed by GameBoMMM game design group (Mauro Salvador, Max Theaged and Moozhan Shakeri) as part of the Games for Cities summer school held in Amsterdam in 2016.

create games that not only offer their players a good user experience, they can be used as data collection tools. The environmental storytelling techniques, world building principles and fictional narratives/environments are proved to be very helpful techniques for feeding in and collecting data from the game environment and improving the user experience in this study. Using these techniques will help better design of data flow between the real world and imaginary world of games while providing the detachment from the real world which is necessary for ensuring the fun elements of the game.

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