

Full length article

Overlay Design Methodology for virtual environment design within digital games

Ikhwan Kim, SukJoo Hong, Ji-Hyun Lee*, Jean-Charles Bazin

Graduate School of Culture Technology, KAIST, Republic of Korea

ARTICLE INFO

Keywords:

Digital game
Virtual environment
Landscape architecture
Overlay Design Methodology
Protocol analysis

ABSTRACT

Virtual landscapes in digital games have become more expressive and impressive. However, design methodologies that can efficiently implement them have rarely been developed. In real-world landscape architecture, a design methodology called Overlay Design Methodology has been commonly utilized that allows efficient spatial design by computing the hierarchy and the placement of the environmental resources. In this paper, we investigate how to apply Overlay Design Methodology for the creation of virtual environments within digital gaming contexts. Along with the establishment of the design methodology, we measure the effectiveness of the methodology with protocol analysis and survey to 30 game developers. As we observed, the Overlay Design Methodology doubled the collaboration among team members and reduced unnecessary time in the design process by over 98%.

1. Introduction

Designing and producing detailed virtual environments is a time-consuming task for game designers, programmers, and artist. Contrary to other areas of game design such as designing characters, UI, rules within the game, designing a virtual environment of a digital game requires a comprehensive consideration as well as extensive editing of the various digital game components. For this reason, Choi [1] mentioned that designing a virtual landscape requires the same amount of effort as creating a digital game itself. Therefore, designing a virtual environment require a great amount of manpower and usually is the most time-consuming process within game designing. According to Rolling and Morris [2], it is critical to establish a precise design methodology to develop a digital game. To quantify Rollings and Morris' statement, we interviewed 21 game designers, 9 game artists, and 8 game programmers from the digital game industry with an average career duration of 12 years. We asked them the question: What are the challenging aspects of designing a virtual environment within a digital game from the field? Participants were allowed multiple answers, thirty participants responded with three answers, and the eight participants responded with two answers. Among the 106 responses collected, the answer to the lack of universal design methodology was most repeated 36 times. The second most frequently collected answer with 34 answers is issues of communication between different teams and individuals. The interview participants pointed out that without any clear design methodology, the quality of result greatly

depends on a few senior designers' experiences. This phenomenon suggestive that if these senior designers leave the project part-way through, the rest of the team loses valuable guidance, which might lead to reducing the quality of the design. Without any available effective communication tool between designers, artists and programmers, it has been a challenge to conceive and deliver a cohesive concept of a virtual environment into a digital game. Game designers have to write a vast amount of documentation to describe their design, and likewise for game artists and graphics teams, with numerous concept sketches and drawings. Several design procedures are known to be used by digital game companies. These design procedures are not universally applicable, exclusively based upon the characteristics of a specific digital game project. Based on the interview, we could understand developers need to learn and use multiple design methodologies, causing an increased amount of work. The various characteristics and different design methodology make the establishment of any universal design methodology even especially challenging.

As studied by Streitz et al. [3] and Lange [4], many approaches have been proposed to advance the virtual environment design of digital games. However, they focus on technical aspects or approaches from the area of humanistic like investigating a psychological approach to digital game Users [5], and therefore do not provide a practical design methodology for the designers.

Several approaches to develop an automated design methodology for the digital game's environment design like Lopes et al. [6] have run,

* Corresponding author.

E-mail address: jihyunlee@kaist.ac.kr (J.-H. Lee).

however, this automated design methodology only sketches the potential of new design methodology but do not deliver a practical design methodology. The interview results confirmed the fact that practical design methodology which can be adopted to the design process in the field and can help developers to communicate with each other more efficiently is needed. We think it will be helpful for game designers, programmers, and game artists to develop a comprehensive design methodology which can adopt every type of digital games (i.e. 288 types of digital game). The proposed design methodology will work as a guideline to raise the quality of the result and we hope that game companies will be able to save manpower and time to design and build a design work.

Landscape architecture in a real world is a field of study which involves designing outdoor spaces. To design such spaces, landscape architects need to consider various characteristics a landform contains. These include various information from natural and artificial resources like from flood level to traffic networks, a vast amount of information needs to be considered. For this reason, Overlay Design Methodology (7) is a well-developed design methodology within the field of space design and has been used for over two centuries. This methodology allows designers to make multiple layers containing variable information sequentially and to file them so they can be used to create a master plan. This methodology ensures designers to not miss any critical information throughout the design procedure. Moreover, experts in various fields can work on their own layers and communicate with each other efficiently. Designing a virtual environment shares the difficulties of real-world landscape architecture. For example, a designer needs to consider a vast amount of information. Furthermore, the kind of information that requires consideration differs from one digital game to another. With real-world landscape architectural design, dealing with a vast amount of various information to consider and requires close cooperation between experts from different areas such as game designer, 2D or 3D artists and programmers. That is why, in this paper, we propose to investigate establishing a design methodology for virtual environments inspired by the design methodology from the area of real-world landscape architecture.

Developing a form of Overlay Design Methodology for the creation of a virtual environment within digital games would be able to increase the efficiency of the virtual environment design process. Due to the need to improve the efficiency of virtual environment design, the goal

of this research is to propose the use of the Overlay Design Methodology for virtual environment design specifically for digital games. This paper presents several parts to discuss the establishment of a design methodology for a virtual environment.

First, we will clarify the difference between a real space design and virtual environment design. Second, by referencing previous studies on the classification of the virtual environment of digital games, we will identify which layers should be considered while designing virtual environments. Third, this paper will establish the Overlay Design Methodology in digital game design and measure its effectiveness. The Overlay Design Methodology as explored in this research will be able to increase the efficiency of the virtual environment design. Designers will work with higher flexibility and production companies will have stable and improved design result.

2. Related work

2.1. The Overlay Design Methodology

The book *Design with Nature* by Ian McHarg [7] proposed a design methodology called *Overlay Design Methodology* (ODM) for the real-world landscape architects. By following Schnadelbach et al. [8], it was the first attempt to define the problems of modern landscape development and present a methodology or process prescribing compatible a solution with other areas such as urban planning, architecture, and environment. The concept of the design methodology from this book is to let landscape architects file various types of information from targeted terrain as layers, and let the layers be overlaid and combined as a single master plan. Fig. 1 shows a representative example of the design methodology. Landscape architects present the design of a new city with the concept of layers, such as productive green areas, water network, build up areas, territorial organization, and infrastructure corridors. If the design is shown with a single plan, it would be difficult to consider all the spatial resources and the interaction between them. Instead, by approaching the resources individually, landscape architects could organize and design them efficiently.

By following the ODM methodology, landscape architects can list the resources they should not omit and can design a space with higher efficiency. In addition, designers from various areas such as architects, landscape architects, street furniture designers and civil engineers can

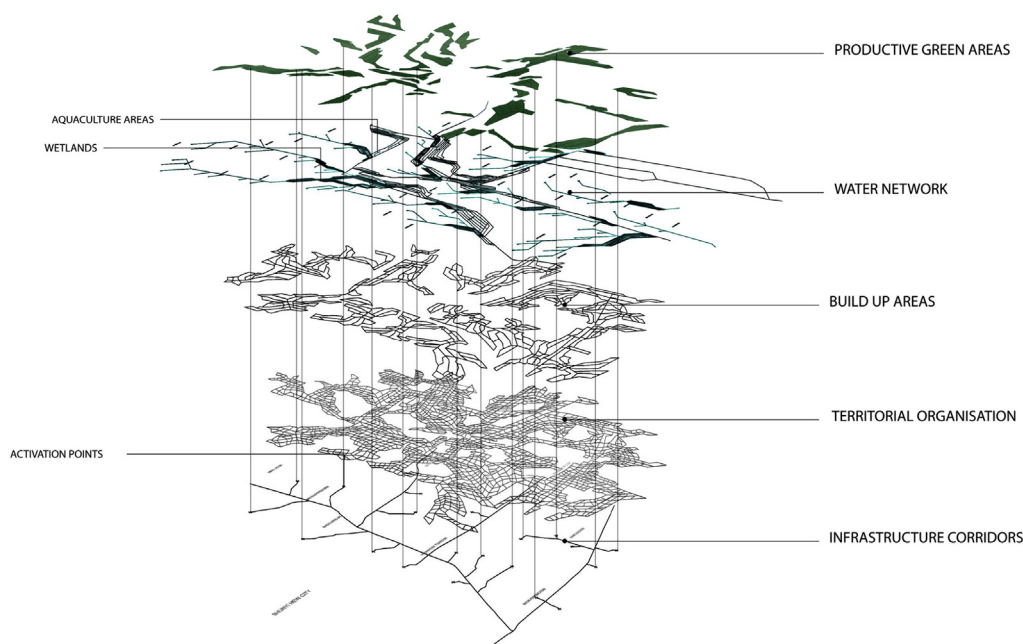


Fig. 1. Example of the Overlay Design Methodology.

Download English Version:

<https://daneshyari.com/en/article/9951824>

Download Persian Version:

<https://daneshyari.com/article/9951824>

[Daneshyari.com](https://daneshyari.com)