

Virtual Landscape Design Patterns in Albion Online

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Abstract: The digital game industry has significantly contributed to the global entertainment economy in the last twenty years. Designing a virtual landscape consumes the greatest effort and time in game development, but only a limited number of landscape architects are joining the industry. We can expect that future landscape architects will join the industry, as virtual landscape shares similar characteristics to physical landscape, and they need to be prepared. Therefore, we need to understand the current status of virtual landscape design, which is the goal of this research. We selected the concept of *Pattern Language* because today's game industry is unaware of the advantages of design patterns and a common vocabulary. *Albion Online* was selected because the game has various landscapes and relatively easy access. Virtual landscapes in the game were analyzed by reverse-engineering methodology. As a result, sixteen design patterns were found throughout a level. This indicates that today's game industry isn't actively using design patterns. However, we can assume that if well-trained landscape architects join the game industry, they could efficiently design richer landscapes with various design patterns. We need to start the education and training of young landscape architects for this new frontier.

Keywords: Virtual landscape, design pattern, design methodology, digital game

1 Introduction

The global digital game market was valued at 220.79 billion USD in 2022 and is expected to expand (VIDEO GAME MARKET SIZE & SHARE GROWTH REPORT n. d. 2022). Designing virtual landscapes in games is the most critical and time-consuming task in their development (KIM 2019). Though the industry suffers from inefficient landscape design without landscape architects' participation, insufficient inroads have been made into the field of landscape architecture. One of the reasons for this situation is the absence of study or courses on this subject in landscape architecture education. Some courses try to adapt the topic, but most use virtual landscapes to improve the design of physical spaces. However, we can expect that future landscape architects will join the digital game industry or other industries related to media as virtual landscape shares similar characteristics to physical landscape (KIM 2019), and preparations are needed. Therefore, we should understand the current status of virtual landscape design, which is the goal of this research.

The reason why designing a virtual landscape is the most consuming part of game development is that it has a unique feature compared to space designs in other media, namely interaction. However, the game industry still adopts methodologies from old and non-interactive media such as movies. We need landscape architects in this industry to design proper interactive spaces because we have been trained to design interactive spaces more efficiently and effectively (KIM 2019).

We selected the concept of *Pattern Language* (ALEXANDER 1977) as our target. Design patterns are to overcome the deficiencies that arise due to the non-universal design procedures of the digital game industry, with common design patterns that can be systematically provided between designers as a vocabulary (KIM & BAZIN 2018). This shared vocabulary is

required in order for the digital game design process to be efficient (KREIMEIER 2002). Adopting existing vocabulary and methodologies taken from physical landscape architecture into virtual landscape design will be beneficial (KORKMAZ & KIM 2022). If the industry adopts them, we can expect a more productive design process and better designs in the game industry. Additionally, the findings of this research will be helpful for landscape architects to expand into a new domain.

2 Reference Study

2.1 Design Patterns in Digital Game Industry

ALEXANDER (1977) pioneered the concept of *Pattern Language*. He tried to find simple and well-formed solutions to design problems of varying scales (DAWES & OSTWALD 2017). More than one alternative solution can be found for a problem, but the combination of problem and solution is the crux of the *Alexander Model* (BARNEY 2020). He sought to identify *design patterns* architects could use to design *good* spaces. With the language of design patterns, a simple building block format has emerged that can help non-professionals to demystify socio-spatial considerations (LEA 1994). We need design patterns in architecture as they can be used to solve specific problems and perform the *animation* process, which is another critical task. According to ALEXANDER (1977), unless all people build buildings in society with a common language, they will not be able to maintain their vitality. He found 253 patterns and argued that designers should develop this *Pattern Language* and that they can develop languages completely independently (BARNEY 2020).

ALEXANDER's (1977) findings and the virtual landscape design have common features. Patterns are used in software engineering or any field to explain design decisions. Following his path, KREIMEIER (2002) identified *design patterns in digital games* and proposed pattern formalism for digital game design. He focused on four basic elements; *Name, problem, solution, and consequences* overall, called *Pattern Template*, in digital games. As KIM (2019) mentioned, a shared vocabulary is required in the field because game development is a cooperative design process with the participation of numerous designers from various fields. His study presents the effect of a design methodology based on the shared design vocabulary.

2.2 Kim's Virtual Landscape Methodology (2019)

For a coherent virtual landscape design, effective communication between designers, artists, and programmers is critical (KIM 2019). He addressed the lack of efficiency, common language, and method in current game design and proposed a *Design Methodology for Virtual Landscapes in Digital Games*. Before the game designers learned this method, they worked on scribbling sketches without unified language. This made it difficult to understand each other and did not provide consistent information. After learning the methodology, the teams could present their ideas systematically. KIM (2019) could observe that the shared design methodology can save 14% of the time and 74.3% of the cooperative work and increase the result's quality. Not only to understand the value of design language in the game industry, but this study also adopted KIM's (2019) methodology to reverse engineer the target landscape in the game. The methodology suggests designing the landscape as a combination of different layers, such as the natural, artificial, and media layers, as shown in figure 1. By

following the structure of the methodology, we could dismantle the target site systematically and analyze it layer by layer.

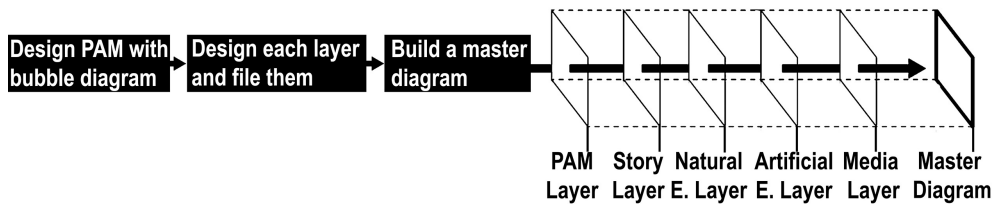


Fig. 1: The structure of the layer-based virtual landscape design methodology

3 Research Methodology

3.1 Reference Study

We conducted a series of literature reviews to understand the concept of design patterns, mainly with the work of ALEXANDER (1977) and KREIMEIER (2002). Based on their studies, we could understand how to adopt the concept of design patterns to evaluate the target landscape in the game. We also studied *Pattern Language for Game Design* from BARNEY'S (2020). However, the strategy KREIMEIER (2002) followed for finding the design patterns in the games was decided to be followed because he is the initiator of the field. We also conducted a reference study about reverse engineering based on KIM'S (2019) study. ANONYMOUS (2022) studied *Reverse Engineering in North Korea's Gaming Economy*, but because their case study was not about reverse engineering on mapping, we could not adopt their theory in our research. We could understand that originally KIM'S (2019) methodology was a design methodology to design and build a virtual landscape. However, we could adopt the methodology in a reversed way to analyze the design of the target space's design.

3.2 Reverse Engineering *Albion Online*

We selected KIM'S (2019) methodology to reverse engineer *Albion Online* (SANDBOX INTERACTIVE 2017), a Massive Multiplay Online Role-Playing Game (MMORPG). The game was selected because it has a large, open world and is relatively easier to access than other games. Additionally, as an MMORPG game, various players run diverse activities spontaneously, such as hunting and dueling, and designers focus on emphasizing these activities with the landscape and its assets (Figure 2).



Fig. 2: Royal Continent and biomes of Albion Online

Within the game, we selected *Longmarch Meadow* as the target site because it is mainly for new starters and carries every basic element in the game. By following KIM's (2019) methodology in reverse, we could organize the location and the condition of every asset on the site in the form of a *master diagram*, figure 3. This reverse engineering is the preferred method to find the locations of the assets that make up the game's map and to find the design patterns that ALEXANDER (1977) introduced.

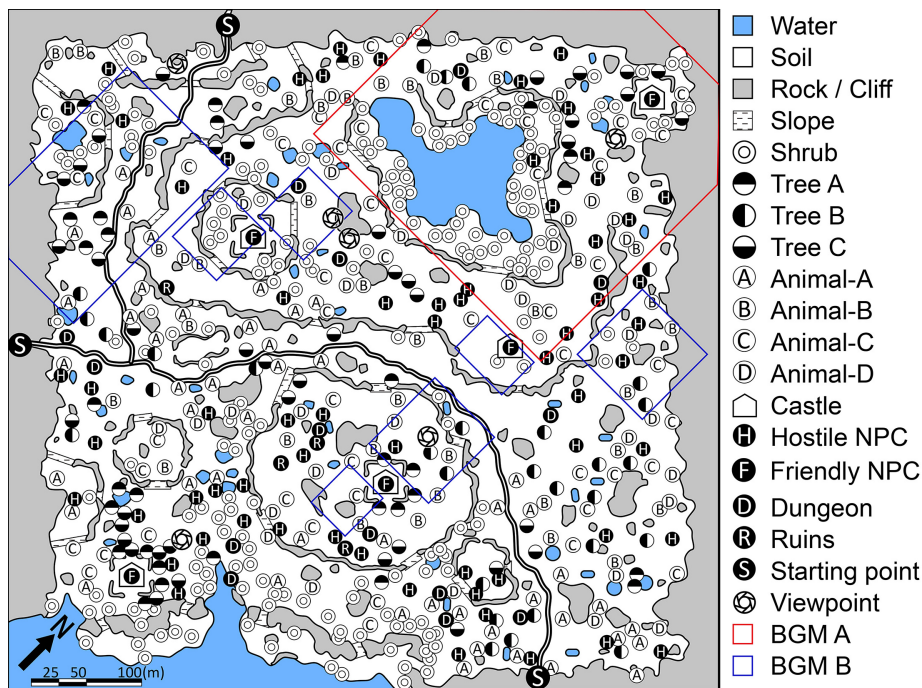


Fig. 3: Master Diagram example of *Longmarch Meadow*

First, we found the site's map from the game's official website (www.albiononline2d.com) and transferred it to Autocad, and scaled it according to the dimensions from the website. Geomorphological mapping of the area was made on the scaled map, and the levels on this map were calculated as average by taking the avatar's height (1.8m) in the game as a reference. Second, we manually measured the landscape's size, location, and number of assets. The average walking length of an avatar is taken as a reference, which is 0.762 meters. The locations of assets were measured by counting the number of avatars' steps. Third, we organized the collected information about assets in each layer, such as the story, natural, artificial, and media layers. Combining all layers, the *master diagram* of *Longmarch Meadow* (Figure 3) was visualized using CS Photoshop software. With the *master diagram*, we could find design patterns in the landscape on various scales.

4 Result

By analyzing *Longmarch Meadow* with the *master diagram*, we could discover 16 design patterns mentioned in *A Pattern Language* (ALEXANDER 1977) in five fields; Arenas, Dungeons, Environment & Media, Non-playable Characters (NPC), and Circulation. In figure 4, these five design fields are in the main headings. The design patterns from *A Pattern Language* are included in the subtitles with page numbers. Problem-solution logic of the design models is at the center of these analyses. We followed KREIMEIER'S (2002) *Pattern Template* for the analysis. Firstly, the definition of design patterns by ALEXANDER (1977) is explained. Second, the similarity of the design patterns found with the game's design patterns is explained depending on the problem (issue) and solution. We added figure 4 to present the design patterns.

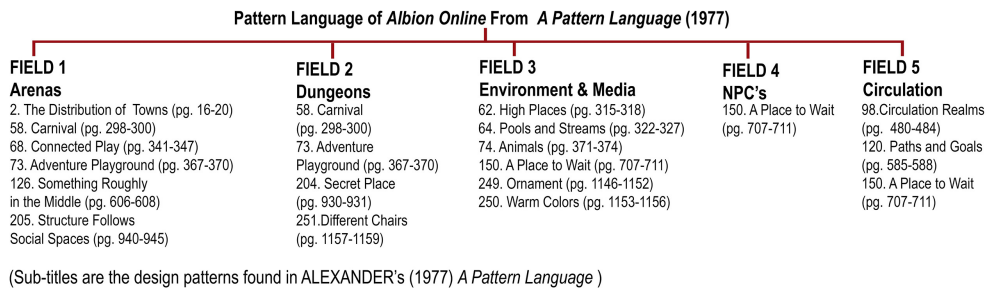


Fig. 4: Design patterns in *Albion Online*

- **Pattern 1.1. *The Distribution of Towns.*** *Civilization cannot develop in a place where the population is disproportionately concentrated. Balance in population distribution is required.* **Issue:** Multiplayer online games may freeze or crash due to overload players. **Solution:** Designers created five isolated areas to minimize the number of players per space.
- **Pattern 1.2. *Carnival.*** *A city needs its fantasies, just as an individual must imagine magnificent events to unleash their inner strength that daily events cannot restrain.* **Issue:** Players can easily be bored with routine content. **Solution:** With five arenas placed and helped players to interact with other thus, the routine was avoided.
- **Pattern 1.3. *Connected Play.*** *Kids need each other for their mental health.* **Issue:** In the game, the players are often alone, and their relationship with other players is limited. This makes players drop the game. **Solution:** In arenas, players have to work together, which creates an emotional bond, and that helps players to bond more.
- **Pattern 1.4. *Adventure Playground.*** *Adventurous and imaginative play should exist.* **Issue:** Adventure playgrounds exist all over the game, but these adventure playgrounds sometimes do not meet the needs of the player thus, they can search for different adventures. **Solution:** A different adventure playground is designed with arenas where players can form groups and spend time together. The adventure playground experience in arenas is different from the experience elsewhere in the game.
- **Pattern 1.5. *Something Roughly in the Middle.*** *A public area is an open space that can carry out various activities.* **Issue:** The lack of understanding of the purpose of the arena and the feeling of emptiness in the space. **Solution:** NPCs and other assets, such as treasure chests, were placed in the arena to fill this void. Thus, the space became meaningful.

- **Pattern 1.6. Structure Follows Social Spaces.** *The physical spaces of a structure must match the social spaces determined by its occupants' activities and social groups.* **Issue:** The game's space has a unique style of the middle ages. Therefore, the structure materials should reflect the period. **Solution:** In the arena design, a design compatible with the area and its social environment was achieved using cut stone on the walls and slate on the floor.
- **Pattern 2.1. Carnival.** Same contents as Pattern 1.2. **Issue:** Players can easily be bored with routine content. **Solution:** With different dungeons placed, a new entertainment area became part of the game and helped players to interact with other thus, the routine was avoided.
- **Pattern 2.2. Adventure Playground.** Same contents as Pattern 1.4.
- **Pattern 2.3. Secret Place.** *People must live with a secret place in their homes that is used in special ways and moments.* **Issue:** Special areas are needed in the game that can excite players with their mystery. **Solution:** Different dungeons have been designed, creating a mystery and providing new experiences, which increases stress and curiosity.
- **Pattern 2.4. Different Chairs.** *People come in various sizes and sitting positions. While picking out chairs, users should consider choosing a wide range.* **Issue:** Beginner, intermediate and expert players exist in the game at the same time. Dungeons should be usable and experienceable for every level of players. **Solution:** Separate dungeons are designed for experts and beginners without entry limits. Players can select any options.
- **Pattern 3.1. High Places.** *One of the most fundamental human instincts is to go to a high point where you can survey the surrounding.* **Issue:** No landscape observation chance exists at different topography levels makes the game unattractive. **Solution:** Topography was shaped to make a dynamic emotion. In hills, rocky areas, the coast, and the lake at the lower level can be accessed, and each is located at a different level.
- **Pattern 3.2. Pools and Streams.** *We are mostly made of water, it's where we come from, and it greatly impacts our mentality.* **Issue:** Players can easily be aggressive in *Albion Online*, and players' stress levels are consistently high. It is important to offer the player relaxation. **Solution:** *Longmarch Meadow* has many water elements for relieving stress.
- **Pattern 3.3. Animals.** *Animals have an equally significant role to deliver a specific atmosphere of the space, as do trees, grass, and flowers.* **Issue:** Players hope to feel various space and their atmosphere in the game. However, it will be a burden to provide for all species of animals. **Solution:** Different biomes exist in the game, with the addition of different animals in each biome. This lets players travel through various biomes and feel the space with different animals. Also, animals are non-player characters (NPC), but we took them under Environment & Media as they are the biggest part of the environment.
- **Pattern 3.4. A Place to wait.** *Conflicts or bored can occur during the waiting process. It's crucial to mix up the waiting time with other activities.* **Issue:** Players enter a waiting period on the road. Therefore, players will get bored and impatient during the waiting period. **Solution:** Extra activities have been added to make the waiting process more enjoyable for players. While crossing the road, the player can cut down a tree and dig a mine.
- **Pattern 3.5. Ornament.** *Everyone has an inner urge to decorate their surroundings with ornaments. However, properly applied decorations will only be effective because decorations serve a specific and clear purpose in a building or space.* **Issue:** The virtual landscape seems incomplete without small touches. **Solution:** The designers decorated the landscape

to increase realism by placing different abstracted-designed assets without any practical function.

- **Pattern 3.6. Warm Colors.** *The warmth of a space's colors influences whether a space is comfortable or uncomfortable.* **Issue:** The atmosphere of the game is tough and rapid causing stress to players. **Solution:** The comfort feeling in the game is provided by landscapes with warm-toned colors.
- **Pattern 4.1. A Place to wait.** Same contents as Pattern 3.4. **Issue:** Sudden stress is required in the game to let players focus. **Solution:** Designers placed surprises by placing enemies in a random algorithm.
- **Pattern 5.1. Circulation Realms.** *People are under great mental stress because they have no idea where they are. We can assume that a person must always have a mental map or set of instructions when they travel.* **Issue:** Players may get lost due to the large areas. **Solution:** A map is placed in the right corner of the game as a user interface (UI) that navigates players.
- **Pattern 5.2. Path and Goals.** *A path's design is suitable for walking when it appears proper and comfortable. Targets must be positioned in regions of natural interest to organize paths. The paths are then created by connecting their targets.* **Issue:** The site is vast, and players can easily get lost to get out of the site. **Solution:** Designers placed main axis-based roads, so players can move from one to another with minimum confusion.
- **Pattern 5.3. A Place to wait.** Same contents as Pattern 3.4. **Issue:** It is challenging for players to have fun if they all share the same road. **Solution:** Designers provided enough roads with various options, so players can select with their condition and taste.



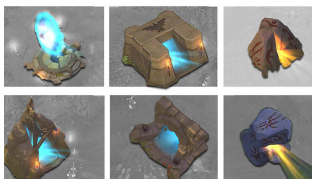
1.2-Pattern: Carnival



1.5-Pattern: Something Roughly in the Middle



2.2-Pattern: Adventure Playground



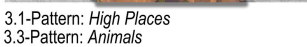
2.4-Pattern: Different Chairs



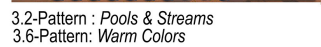
3.1-Pattern: High Places



3.2-Pattern : Pools & Streams



3.3-Pattern: Animals



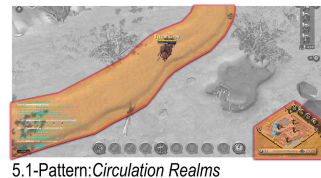
3.6-Pattern: Warm Colors



3.5-Pattern: Ornament



4.1-Pattern: A Place to Wait



5.1-Pattern: Circulation Realms

5.3-Pattern: A Place to Wait

Fig. 5: Examples of Design Patterns in *Albion Online*, *Longmarch Meadow*

Designers used 16 design patterns in *Longmarch Meadow*, repeated with the same strategy in every region. This indicates that only 6% of design patterns from *A Pattern Language* were used.

5 Discussion and Conclusion

In *Albion Online*, *Longmarch Meadow* region, only 16 of ALEXANDER's (1977) 253 design patterns were used. These patterns come together differently to form the five design fields of the game. Considering the scale of the level, we can understand that only a limited number of patterns were applied. These 16 patterns repeat in the other regions of the game, so we can assume that design patterns in the game created a systematical approach to design and helped to solve issues over the different regions. We can assume that if more of these 253 design patterns that ALEXANDER (1977) can be included in the digital game design with well-trained landscape architects, many limits in the digital game industry can be resolved.

Digital game development must have a precise design methodology (ROLLINGS & MORRIS 1999). Landscape architects, a systematically working professional group, should be realized by the digital game industry, which is an important value of today and the future. Unfortunately, the current game industry is unaware of these advantages so issues arise in the industry (KIM 2019), such as design taking longer and the final result's quality is not satisfying (PETRILLO et al. 2009). At the same time, landscape architects need to realize the advancing technology and this developing industry. They need to start investing and working to be involved in this field as they have the potential to take a big role in the industry. Researching design patterns from the landscape architecture field can be a solution to overcome the limits that arise due to the non-universal design procedures of digital game companies with common design languages (KIM & BAZIN 2018). We need to merge landscape architecture and the game industry.

The characteristic of spaces between the physical space's landscape and the virtual landscape exists, and this makes traditional landscape architects to be hesitated to expand their design domain. However, both spaces carry the same characteristic in the root, the interactivity, and the only difference is the depth of those interactions (KIM & BAZIN 2018). This presents that the professionalism of landscape architects is valid in a virtual landscape design. They can design space more efficiently by imagining an area on a large scale and designing a plan. Additionally, they have information about vast references. It is obvious that landscape architects' performance will be more efficient and provides better quality result compared to those who currently are designing virtual landscape without any understanding of space.

At the same time, this paper carries limits. We only could examine one game and should have measured the efficiency of design patterns more statistically. Therefore, in future research, design patterns will be examined through different games, and the contributions of design patterns will be explored in depth. However, this paper still carries potential as a study investigating the value of landscape architects and their design methodology in a rising frontier.

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