

Discussion on the use of new technologies such as artificial intelligence (AI) and virtual reality for the development of theme parks

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Abstract

With the advent of AI, our society's interest in artificial intelligence (AI) has exploded, which has led to an increase in various government policies and an increase in interest and participation by companies. Theme parks using natural and local resources (mines, farms, etc.), urban theme parks, and theme parks using animations and movies (Disneyland, Universal Studios, etc.) are continuing in the form of combining various contents and technologies. Therefore, this study aims to examine the development potential of theme parks in line with the trend of the times. In other words, it was intended to examine whether artificial intelligence (AI) technology can be applied to theme parks and future development directions.

Keyword : *Theme Park, AI(Artificial Intelligence), AR(Augmented Reality), VR(Virtual Reality), New Technology*

1. Introduction

In 2016, AlphaGo is a Go artificial intelligence (AI) program developed by Google Deep Mind. It is the first artificial intelligence (AI) program to beat a professional player in Go match. At that time, he completely overturned the Go paradigm by winning against Lee Se-dol.

With the advent of AI, our society's interest in artificial intelligence (AI) has exploded, which has led to an increase in

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various government policies and an increase in interest and participation by companies. In recent years, the development of technologies such as artificial intelligence (AI) and virtual reality has spread throughout society, leading to a trend of application to all industrial fields. In the “Artificial Intelligence (AI) National Strategy (Joint with Relevant Ministries)” announced by the government in 2019, you can also see the policy for full-scale use of artificial intelligence (AI) across industries.

In particular, artificial intelligence (AI) has become a technology that is applied not only to a specific field, but to the entire industry. It is already being used in all industries such as manufacturing, biomedical, city/logistics, agriculture and fisheries, cultural contents, and national defense.

2. Prior research on theme parks

A theme park is a space built for people to enjoy based on a certain theme. In addition, with the development of culture, industry and technology, commercial facilities such as amusement facilities, museums, and accommodations are also included in theme parks.

Several scholars also define a theme park. Cameron (1981) defined it as a tourism industry that includes cultural or other non-profit facilities such as fairs, amusement parks, museums, and zoos in a certain area, and Vogel (1991) defined it as a tourism industry. It was defined as a business that sells fun and interesting experiences, not just a business that sells tickets for amusement facilities or drinks. In addition, Milman (1998) defined it as a place that creates a fantastic atmosphere as well as museums and exhibitions based on a special theme in a closed space that stimulates tourism. It is defined as a comprehensive cultural park that provides interest and pleasure to people by directing using materials such as entertainment, convenience facilities, performances, events, food and beverages, and products.

There is no major change in the concept of theme parks by previous research scholars. However, as time passed, we can see that theme parks were developing along with the development of the industry. Theme parks using natural and local resources (mines, farms, etc.), urban theme parks, and theme parks using animations and movies (Disneyland, Universal Studios, etc.) are continuing in the form of combining various contents and technologies.

Therefore, this study aims to examine the development potential of theme parks in line with the trend of the times. In other words, it was intended to examine whether artificial intelligence (AI) technology can be applied to theme parks and future development directions.

3. Theme parks utilizing content and technology

3.1. Universal Studio

Universal Studios is a theme park based on its own films, and is open and operating in Los Angeles, Orlando, Japan, and Singapore. Major content includes The Wizarding World of Harry Potter, The Simpsons, Jurassic Park, Transformers, Revenge of the Mummy, and more.

Universal Studios utilizes 4D and 4K video technology to increase the level of immersion in the viewing and experience of the themes. Through this, we are creating spaces where visitors can immerse themselves in each story.

In this way, by actively utilizing the company's popular movie and animation contents to ensure the individuality of each space in the theme park, it not only secures a wide range of visitors, but also has a high revisit rate. It is also a landmark of the region and serves as a major tourist product.

3.2. Disneyland

Disneyland is the world's first theme park that opened on July 18, 1955. It has been opened and operated in the United

States, Japan, France, Hong Kong, and China. The main content is Main Street. U.S.A. (Main Street U.S.A.).

Disneyland is using technologies such as 3D screen and 4D live to increase the degree of interaction between the audience and the contents in order to increase the degree of immersion in viewing each theme.

In addition, the theme park is decorated with various events such as using Walt Disney characters. The fantasy element is maximized for those who visit by thorough isolation from the outside world, and security management is thoroughly operated as much as a large crowd gathers.

3.3. Everland

Everland started in April 1976 as Yongin Nature Farm, the first family park in Korea, and was renamed Everland in March 1996. The main contents are classified into theme areas such as 'American Adventure', 'Magic Land', 'European Adventure', and 'Zootopia'.

Everland is increasing the utilization of the latest technology by utilizing ICT devices such as VR to increase content immersion and provide various experiences.

3.4. Lotte World

Lotte World was officially opened in July 1989 as Lotte World Adventure. The main content consists of 'Adventure 4 floors', 'Magic Island', 'Kiddy Zone', and 'Underland'.

Lotte World is also organizing and directing the space by applying technologies such as 3D and 4D to increase content immersion. In addition, it is connected to shopping malls and movie theaters to increase visitor satisfaction.

4. Application of AI and VR

4.1. Disney's virtual world simulator

At the end of 2021, Disney announced a 'Virtual World Simulator' registration number. Augmented Reality (AR), which is currently being implemented, can only be experienced by users using digital devices such as HMDs. However, it is inconvenient because the user must wear a device such as an HMD. However, Disney's 'virtual world simulator' shows the virtual world by projecting images into the real world so that users can experience it without using special devices.

A 'virtual world simulator' is a way for users to create an immersive virtual environment by projecting images from rides or specific places in the theme park. It then communicates with a tracking system containing optical sensors to track the user's movements and maintain the virtual world experience as they move.

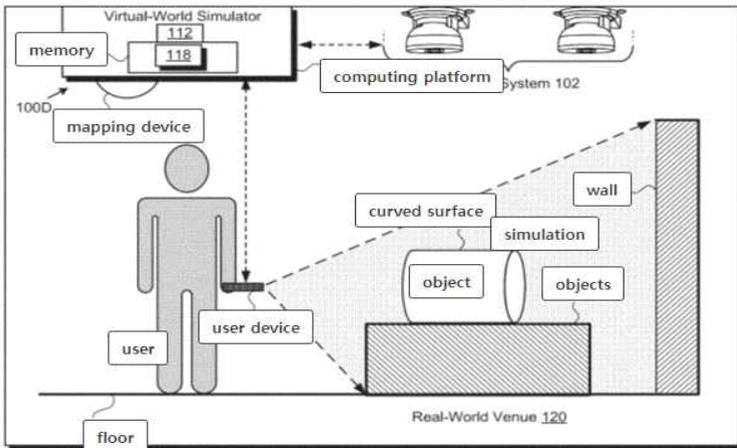


Figure 1. Virtual world simulator (Source: <https://www.keywert.com/detail?uud=0d0469c8-ffc-4a5d-88ff-2b3e7bdb24c9>)

4.2. Everland's artificial intelligence (AI) based media art video

Around October 2021, Everland exhibited artificial intelligence AI-based media art videos through cooperation with Hongik University. The work was carried out through industry-university cooperation, and it was screened 3-4 times a day on a large 11-meter-high LED screen in the Four Seasons Garden of Everland.

The exhibition uses the 'super-resolution AI style transfer' technology, which uses artificial intelligence (AI) technology to add the sensibility of works of art to existing photos and videos.



Figure 2. 'Virtual World Simulator' Patent Drawing
(Source:<https://www.joongang.co.kr/article/25015818>)

5. Necessity of new technologies

In building and developing theme parks, economic effects and the number of visitors are considered particularly important. This is because it has an important influence on the development plan for the development of the theme park.

A significant number of theme parks are already utilizing key technologies that have been developed to meet these

important characteristics. As can be seen in the case above, with the recent development of technologies such as AR and VR, major theme parks are applying virtual and augmented reality in the right place to increase the immersion of visitors and increase the satisfaction of the experience. And it is believed that the speed of change will accelerate in the future. This is because the speed of technological development has been accelerating since the late 1990s and the 2000s, when the development of ICT technology began in earnest. This does not simply mean the development of technology, but is leading to a change in the paradigm of the entire society, including people's lifestyles and social infrastructure. And because the standard of living of people who have changed with the development of technology has also improved, the use of new technology in theme parks is an essential element.

Recently, new technologies, including artificial intelligence (AI), have surpassed technological advances. Various efforts to get closer to the public are being made along with the development of technology. The grafting of technology and play and the active convergence between industries are things that we can all recognize.

Theme parks are an industry based on play. As such, it is an industry that has a direct impact on people's satisfaction and interest. You can tell by looking at the fact that most of the studies related to theme parks are about satisfaction. The discussion of this study will not be special or new. However, this discussion is attempted at this point in time to emphasize that, despite the various efforts of theme parks, new technologies change and develop rapidly, so the possibility and flexibility for the use and application of new technologies are always necessary.

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Everland (www.everland.com)

Lotte World (<https://adventure.lotteworld.com>)

Universal Studio (<https://www.universalstudioshollywood.com>)

