

# A Study on the Analytical Method of Digital Games

## – Focusing on Adventure Games

Myung-Hee Cha<sup>1)</sup>

### Abstract

Nowadays, The need for game research has been highlighted by the growth and popularity of the game industry domestically and internationally, and the game research is steadily growing in Korea. While pointing towards the issues of the existing game research, arguments for a new research paradigm have emerged. In this paper, we attempt to find an analytical method based on the unique characteristics of game, not an analytical framework of other studies, as a reach to find a critical analysis method of the digital games. By applying this model directly to the game analysis, we aim to find an analytical model focusing on the game play rather than the existing narrative analysis, particularly in analyzing the adventure games with powerful storylines.

**Keyword:** game planning, adventure game, game analytical method, game play, 3D game, Artificial Intelligence

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1) Faculty of Dept. of Multimedia Design Seoul Cyber University, Seoul, Korea  
e-mail: princess@iscu.ac.kr  
Received(May 15.2017), Review (June 15.2017), Accepted(June 30.2017)

## **I. Introduction**

The need for game research has been highlighted by the growth and popularity of the game industry domestically and internationally, and the game research is steadily growing in Korea. If Russell's <Spacewar!> of 1962 is viewed as the beginning of computer games, the history of human games goes beyond more than half a century. As with the emergence of television, the early research began with a negative view of harm or side effects or addiction of the games. It is now argued that games should be studied as a new form of art (Aarseth (2001), Jenkins (2002), Newman (2004), and Park Geun-seo (2005)), and the demand for game critique and the tentative approach may be seen [1,2][5][7][15].

While pointing towards the issues of the existing game research, arguments for a new research paradigm have emerged. Park Dong-sook (2000) presents research themes such as a new method of communication, which is based on the characteristics of online game text, the new communication method within the game, the properties of experience of game player in the virtual game space, and the relationship between the virtual and real spaces, among others[3,4]. Park Geun-seo (2005) also advocates the study of the gaming culture as a cultural discourse, breaking away from the game research dominated by the economic and technical discourses, while further presenting a study of desire and pleasure in playing the games[2].

Although the subjects of the critique are somewhat different due to the temporal distance between the two researches, the problem of the game research that is commonly highlighted is that the research of games has not been conducted as an example of the human-computer interaction.

No one has yet presented a constructive solution for such a problem, that is, a method of analyzing the games suitable for a new paradigm, and a method of analyzing a digital game produced by digital technology and information communication technology. While no one denies that digital gaming is a new form of communication and a new culture, the question of how to analyze the digital games at the center continues to be unaddressed.

In this paper, we attempt to find an analytical method based on the unique characteristics of game, not an analytical framework of other studies, as a reach to find a critical analysis method of the digital games. Compared to other linear media, games are dynamic and take on the configurative characteristic by active participation and direct implementation of the player. Furthermore, the excitement and joy of the game is that the player, who is the game subject, participates in the game world and shapes it together with the world, which is formed through the process of the game play. In order to build a system of game analysis focused on the game play, Konzack (2002), who initially proposed the critical analysis method, was examined and those of the other researchers – Aarseth (2003) and Dutton & Consalvo (2006)[5,6][8]. Subsequently, we will summarize the concept of the game play and construct an analysis model focused on the game play. By applying this model directly to the game analysis, we aim to find an analytical model focusing on the game play rather than the existing narrative analysis, particularly in analyzing the adventure games with powerful storylines.

## **2. Existing Research**

### **2.1. Research on the existing games' analytical method**

Konzack (2002), Aarseth (2003), and Dutton & Consalvo (2006) point out the absence of a methodology for the critical analysis of games and have begun to focus on their needs[5][8][13]. First, Konzack (2002) approaches computer games as a whole view, reflecting not only a specific academic point of view but also all of the elements surrounding the games to the extent possible[13]. Different aspects of such a computer game are divided into seven levels [Table 1], with each level analyzed on the equal footing without any bias. Presented is the objective and theoretical analysis framework for the analysis of the computer games. On the other hand, Aarseth (2003) emphasizes the necessity of the analysis method and the type of game research in the game research, while further suggesting the

direction for the conceptual analysis rather than specific game research method[5]. Dutton & Consalvo (2006) identify the purpose of research as a socio-cultural approach to the games and attempt to analyze the games as media[8]. That is, is to explore the ways of expressing and communicating the personalities of the game world and the game culture which arises therefrom, while the 4 factors related to the computer games – Object Inventory, Interface Study, Interaction Map, and Gameplay Log are presented as the limited forms of the analysis method.

Presenting the critical analysis method for games for the first time, Konzack (2002) proposes an objective analytical framework covering the computer game and game situations as an analysis method based on the specificity of the computer games[13]. First, the game situation is largely divided into a virtual space and a play space (play space, playground). That is, it is the virtual space that is the game world to be played and the real space where the play is taking place.

These two spaces are physically separate, but they meet and interact with gameplay under the possible conditions. For the most part, game players immerse themselves in the virtual space of the game as soon as they immerse themselves in the game. However, strictly speaking, even if one immerses him or herself in the game, the player is located in the play space, whereby the play space is ventilated during the play. According to Konzack, one could concentrate on this situation only one space at a time like a picture puzzle.

The next step for a fully driven game analysis is dividing the various aspects of computer games into seven levels – hardware, program code, functionality, gameplay, meaning, referentiality, and socio-culture [Table 1], and the action game <Soul Calibur (1999)> is analyzed by each level. That said, Konzack's research is so valuable as it details the game in a layered model and includes all the complex and multi faceted aspects of the computer games.

[Table 1] 7 Levels of the Computer Game Analysis (Konzack, 2002)

| Level                  | Description                                                                                                                                                                                                |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hardware               | The lowest level associated with hardware technology                                                                                                                                                       |
| Program code           | Ontological level of the program structured by binary code                                                                                                                                                 |
| Functionality          | With the functionality of a computer program, the degree to which the behavior of the user or the response of the computer interface to the input of information, or the behaviors of the computer exposed |
| Gameplay <sup>1)</sup> | The level at which a computer program is recognized as a game                                                                                                                                              |
| Meaning                | The level of the semantic meaning of a computer game that can be grasped through the game play                                                                                                             |
| Referentiality         | The relationship and relativity (re-mediation) with other games or other mediums can be classified into two categories: the level of game setting and genre                                                |
| Socio-culture          | In addition to the interaction between the computer game and the player, which can be observed in the play space, the interrelationship by and between everyone involved in the game                       |

In order to understand the computer game properly, it should be analyzed from various angles on these layers, and rather should be analyzed from a specific point of view under the assumption of such multi faceted characteristics.

Concerning how the games are being studied across various disciplines, Aarseth (2003) argues that the multi faceted nature of the computer games is the multifaceted, extensible nature of the computer itself[5]. Aarseth emphasizes the ability to selectively analyze and study some of the various aspects of the game according to motivation or purpose. When a computer game is generally referred to as a game in a virtual environment, all games could be classified into the 3 general dimensions of gameplay, game-structure, and game-world, each of whose dimensions is defined as 'types of game research.' As each dimension has sub-components as the basic level of analysis, these three dimensions can be studied independently or integrated organically. It is possible to analyze how each dimension influences and changes across the whole game. Among the three dimensions, the game rule of "game-structure" is the broadest foundation of all.

[Table 2] 3 Types or Contexts of Game Research (Aarseth, 2003)

| Types of game research | Example                                                                | Research point of view                                            |
|------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------|
| <b>Gameplay</b>        | Player's behavior, strategy, motivation, and social relationship, etc. | Social, ethological and psychological perspective                 |
| <b>Game-structure</b>  | Rules of the game including simulation rules                           | Game design, industry, law, computer science, etc.                |
| <b>Game-world</b>      | Fictional content, phase / level design, organization, etc.            | Arts, aesthetics, history, history/media studies, economics, etc. |

Dutton & Consalvo (2006) studied the prominent characteristics of games distinguished from movies by actively expressing and communicating with the avatar's appearance or using various elements provided on the screen[8]. The analytical method for Game Inventory, Interface Study, Interaction Map, and Gameplay Log, the 4 areas which researchers should consider when studying games in this respect will be described [Table 3]. This analysis applies to the study of how sexuality is expressed in *The Sims* (2000) and *Expanded Pack – Livin' Large* (2001), *House Party* (2000) and *Hot Date* (2001).

Although it is said that it is an initial template for critical and textual analysis, it is important to clarify the research point of view in advance when approaching qualitative analysis based on the vast and arbitrary nature of the game. Unlike the static item lists or interface studies, the interaction map studies that record and analyze all possible dialogue and selection elements between a player and an object require refinement of prior art research plans. The analytical contents of each element are summarized as follows.

- Object inventory study - Static information analysis, such as what items or objects are provided in the game, its role in the game, economic value, and most popular items
- Interface study - Analyzes the interface consisting of the characters' state information, combat or action controls, and controls that manipulate the elements of game play to analyze the scope and content that can be controlled by the players in the game.
- Interaction map analysis – The most extensive analysis of the various options (dialogue inquiries, all possible routes that can be selected) for players to interact with the other players or the NPCs

- Study of game play record - A discovery method of research that was not expected in gameplay to see how (potentially) the game is open to the player - the contingent behavior or situation of a player, the wider game world, and the textual nature of the world are studied

Except for the gameplay record, all of the four analysis areas correspond to the interface study. However, if the first and second are fixed interfaces, the interaction map is a dynamically changing interface that changes according to space and situation.

These studies are an analysis of the elements of game-structure and gameplay that Aarseth speaks on the socio-cultural layer of Konzack's game, from a clear research point of research on communication style and culture in the game.

Comparing the analytic levels presented in each of the three studies so far, we can ascertain the interesting features of gameplay. That is, the duality of the space surrounding the gameplay. Konzack's duality of the real play space and the non-realistic virtual space, and the duality of the player as a game realistic subject and the avatar as a desirable subject in the game-world[13,14]. Salen & Zimmerman (2004) argue that gameplay occurs across a game space where the game is played and a "Magic Circle," which is the boundary between the game's real world and the game space[9,10]. Therefore, Aarseth refers to everything being a game-play process at every level, and the level of the gameplay he speaks becomes more meaningful when it is modified into a game-environment.

[Table 3] Comparison of the Analysis Area of Dutton & Consalvo (2006) with the Analysis Level/Context of Konzack (2002) and Aarseth (2003)

| Konzack                                                                        | Aarseth                                           | Dutton & Consalvo      |
|--------------------------------------------------------------------------------|---------------------------------------------------|------------------------|
| Level of game play<br>(Sub-component corresponds to<br>resources or knowledge) | Game-structure context                            | Object Inventory Study |
|                                                                                |                                                   | Interface Study        |
|                                                                                | Game-world, Game-structure                        | Interaction Map Study  |
| Social-cultural level                                                          | Game-environmental context<br>(Game play context) | Gameplay Log Study     |

## **2.2. 'Game play' as a repetitive yet changing pattern**

Let us look at various definitions of gameplay. Cognitive science views gameplay as a problem solving process. Game play is summarized as a process by which each players (including the computer and other players) interact with each other in solving problems given to participate in the computer games or achieve goals.

Rouse (2001) defines gameplay as the nature and degree of interactivity the game contains. That is, how the player interacts with the game-world and how the game-world responds to the player's choices. It refers to the interaction of the game-world with the player.

Defining it as 'The game loop,' Glassner says, 'When you play a game you make a very specific decision on a very wide variety of levels[11,12]. In other words, gameplay is a series of iterative but changing processes in which players and game-world interact and achieve goals. Through this gameplay process, the player enjoys the game and discovers the rules of the game. In analyzing the games, especially in analyzing gameplay, it is important to find patterns that are unique to the game – a process that is repetitive yet changes the goal.

Bogost (2006) studied the pattern of gameplay as a way of critiquing the game's 'unit operation' - a semantic generation style that prioritizes discrete and independent actions beyond a deterministic and progressive system[7].

## **3 Game Analytical Model Modified with the Focus on 'Game Play'**

For the purposes of practical analysis, let us now revise Konzack's analysis model around 'gameplay.' According to Konzack (2002), the 'game play' consists of the 7 layers of 'game play' as the sub-components of the player's positions, resources, space, time, goal and subgoals, knowledge, and rewards/penalties[13].

In the case of 'time', if it is a time constraint, it binds with 'obstacle.' Next, classification is made into the elements that the player can manipulate to make a change, and those that

can not. The following is a list of the components of the game play [Table 4].

[Table 4] Components and Classification of 'Gameplay's' Layer

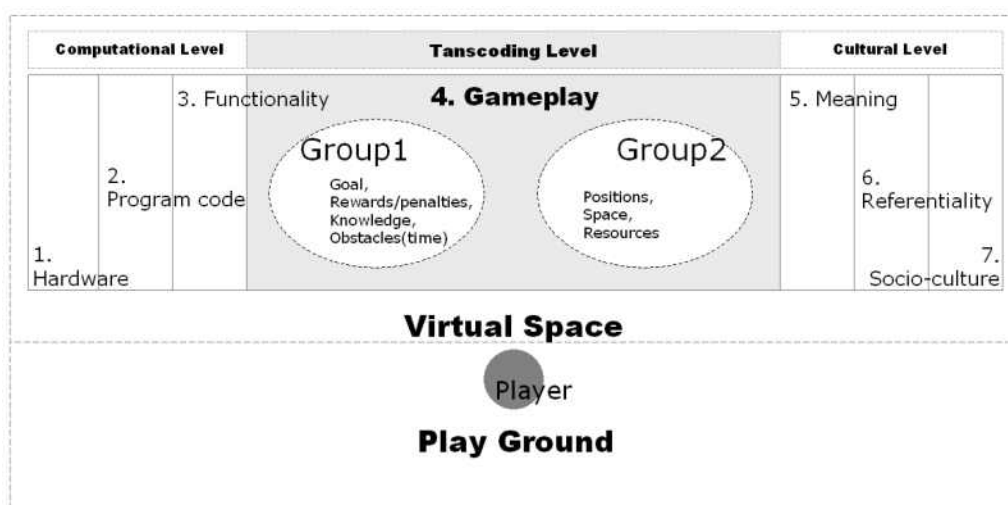
| Classification               | Component       | Description                                                                                                                                                          |
|------------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Can be moved or changed      | Space           | Virtual space, game-world in game where game play happens                                                                                                            |
|                              | Location        | The location or role of the player (games with and without character)                                                                                                |
|                              | Resource        | A means by which the player can influence the game                                                                                                                   |
| Unable to move, but reactive | Goal            | The goal of the game, which is the victory condition of the given game                                                                                               |
|                              | Reward          | Score, money, time, space, etc. arising or consumed in gameplay                                                                                                      |
|                              | Knowledge       | Random knowledge such as rules or statistics available to the player, hidden knowledge such as other players' strategies, and random knowledge such as throwing dice |
|                              | Obstacle (hour) | Obstacles (including time constraints) that prevent players from reaching their goals                                                                                |

The game-play layer is similar to the game-world of Rouse (2001), which has been largely seen above. A game-world as an object that interacts with the player and a game-world that is changed by the player's behavior. It is also a fantasy world created by games and a fictional world experienced through the gameplay. In addition, if the 3 contexts of the game research spoken by Aarseth (2003) were defined, gameplay is an interaction with the game world consisting of game-structure and game-world, which is electronically present yet once asleep now wakes up and activates through the activity of the player's game play. That is, the group that can move or change in [Table 4] matches the 'game-world' in [Table 2] and the group that is 'unable to move but reactive' matches with 'game-structure.' From Lev Manovich's (2004) view, the 7 layers of Konzack (2002) can be divided into 'computer layer' expressed in the electronic language and 'cultural layer' translated under the principle of 'code conversion' [Table 5].

[Table 5] 3 Levels Classified by the 'Code Conversion' Principle and 7 Levels

|                         |               |                |               |                                     |
|-------------------------|---------------|----------------|---------------|-------------------------------------|
| <b>Computer's level</b> | Hardware      | Program code   | Functionality | Gameplay<br>(code conversion level) |
| <b>Cultural level</b>   | Socio-culture | Referentiality | Meaning       |                                     |

Combining these details together, it is possible to visualize Konzack's 7 level models as shown in the following figure [Figure 1].

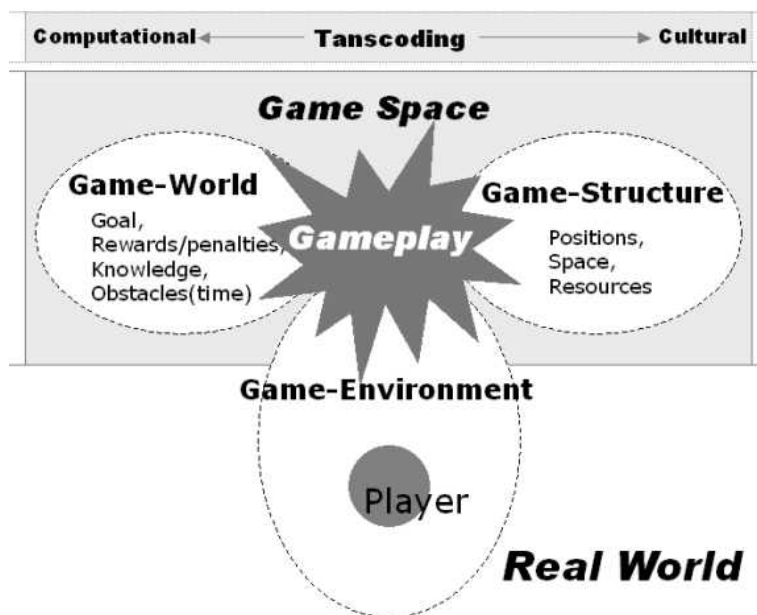


[Fig 1] Analytical Model of Konzack (2002)

In the game conversion process, the game is largely divided into computer level, code conversion level, and cultural level. Computer level consists of hardware, program code, functional layer, code level of game play, cultural level meaning, relevance, and socio-cultural layer. The sub-components of the gameplay that Konzack (2002) refers to are 'moveable or changeable groups' that are close to the cultural layer exposed by visualized images, and 'non-moveable yet reactive' groups are close to the rule or simulated computer layer[13]. Again, Group 1 in the gameplay layer is close to the game-world dimension that Aarseth spoke of, and Group 2 is closer to the game-structure. In conclusion, it can be summarized

as a computer-simulated game-world and a cultural-visualized game-structure over the gameplay layer. This is called the revision analysis model focused on the game play and will be applied to this analysis.

In simple terms, we could divide the virtual space of game into 1) 'game space' and 2) the real space where player is located in the 'real world.' Game play is defined as 'a series of the repetitive yet changing processes of achieving and evaluating goals while interacting with the player and the game space.' Such game play is defined as 1) 'game-environmental context located at the boundaries between the player's real space and the game space while being dualistic spatially and psychologically, 2) the 'game-world context' that is reactive to the player's behavior rather than the player's ability to change due to its strong computer-based electronic systematic nature: goals, rewards/punishments, knowledge or information, and 3) the 'game-structural context' based on computer yet visual and manipulable: the player's location, space and resources. We will analyze each of these three contexts of the gameplay by each context and how to structuralize the gameplay.



[Fig 2] Modification Analysis Model Focused on Game Play

## **4. Case Study**

### **4.1 Analysis: Adventure horror game <White Day: Labyrinth in the Name of School, 2001>**

As per the purpose of this study, the genre was selected as an adventure horror game "White Day: Labyrinth in the Name of School" for the analysis through a gameplay based analysis model with a powerful storyline. This game has been around for a long time, but it has been played steadily and has a high level of storyline and game quality. It is a first person horror game released by the domestic game developer, Sonnori, after three years of development, and is considered an adventure game in terms of the general genre classification.

### **4.2 Game – World context analysis**

The game-world context analysis elements should be integrated into one rather than being analyzed independently. This is because it includes all elements of the whole process of achieving achievement and compensation/punishment by using knowledge or information to solve the obstacle.

If one summarizes the gameplay patterns that appear in <White Day>, one might say that you are going around – getting knowledge and information – solving (problem). Here, 'go around' is linked to the closed situation and you have to find the key and go further. Solving a 'solving problem' leads to a larger problem that will lead to rewards and consume the reward object. The knowledge and information presented at the beginning of 'getting knowledge and information' are direct information that can be directly applied, but as the game progresses, more knowledge can be added and solved through the inference process.

### 4.3 Game – Environmental context analysis

The game–environmental context analysis can be performed by various methods, but this study applied semiotics. We will analyze the process of the player's semantics of this game using the 'binary confrontation' which is the most basic and simple method of semiotics. "White Day" is largely a 'closed:open' bi-partite opposition structure. This confrontation is eventually linked to the biggest and smallest missions of the game "Friendship:Betrayal" and "Survival:Death." Let us take a look at the binomial confrontation of 'Closure:Open' in three paragraphs: Start–Middle–End [Table 6].

[Table 6] Binary Confrontation of 'Closing and Opening' in the Adventure Horror Game of "White Day"

| Closed                                                                                                                                                                                                                          | Open                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| School of night<br>A heart that is still closed to the main character of<br>Soyoung                                                                                                                                             | School of day<br>With the candy, the main character who wants to open the<br>heart of Soyoung                                                                                                                                                                                                                                                                                                                                         |
| -----                                                                                                                                                                                                                           | -----                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Closed door<br>Darkness<br>Locked safe, lock<br>The gatekeeper (chauffeur) = chasing and beating<br>Puzzle<br>The ghost's grudge (closed mind)<br>Confinement and seal<br>Labyrinth<br>A trapped death (a fake death of demons) | Find the key, card key and open it.<br>Find, reveal (match, lighter).<br>Find password and open it<br>Open the door and run away<br>Find the clues and solve the puzzle<br>Find out and release the grudge<br>Find the talisman and unlock each seal (talisman of gold,<br>wood, earth, water, fire)<br>Find the way and collect the talisman (final mission:<br>yin-yang completed)<br>Returning death (real death and eternal life) |
| Mission failed<br>Sung-a<br>March 13th                                                                                                                                                                                          | Mission successful<br>Soyoung<br>March 14th (White Day)                                                                                                                                                                                                                                                                                                                                                                               |

If you look at the opening paragraph first, the space visible in the intro video is a bright daytime school correction.

In the middle paragraph, all the challenges the player has to solve are 'Find the key (password) and open the closed door.' All the puzzles needed to get the key from the main building to the new building and to the auditorium are also intended to gain the amulet of

five that can finally solve the school's confinement. The gatekeepers (Bonggu and Dalgu) suddenly appearing with a key sound is also a person who 'keeps' the door. To avoid this gatekeeper, all you can do is open the door and run away. The ghost that appears in various places and causes the heart to fall is also a 'closed state' with grudge and a 'pseudo-death state' trapped in the space of confinement. In the East Asian thought, death is not the end, but the return. When we return, we die entirely, not to die, but to live forever. It is the life of yin and yang as the harmony and co-prosperity that Yin and Yang, death and life that rotate forever.

The yin-yang plate is completed through finding the labyrinth of the space called 'labyrinth' hidden in the last paragraph, and becomes a 'solution' and 'victory' to solve all closed matters. If you can not reach this end, you will escape from school, but eventually you will fail. In conclusion, the meaning of "White Day" is forever to escape from March 13th, the night before White Day, to escape the sealed school building with Soyoung, and to celebrate White Day on March 14th. In order to end the game, one has to complete the eternal death and life, yin-yang plate.

From a psychological point of view, the first person view provided by "White Day" itself stimulates the subtle satisfaction of peeking. The cut scene, which is provided as a clue to the first mission, is a scene in which a student is beaten by a gatekeeper, which is peeped through the air duct above the toilet. In the head office of the new building, which is a different zone, the surveillance cameras also provide a cutting scene through which one can observe the behavior of the gatekeeper again. In the school closed like a maze, when the gatekeeper chases, it can not but run away, but in this "peek" mode video, you can smile at a scary gatekeeper that you can not look directly at.

As a result of analyzing the actual adventure game of "White Day" through this analytical model, the progress of the game itself is searching and proceeding in the space, so that it presents the mission in connection with the character of the space and requires problem solving immediately where irrelevant with the character of the space. In addition, a simple manipulative action such as a mouse click or a button press will make a meaningful action

node with different meanings depending on the space, and the actions required under one mission to solve the bigger problem by gathering the nodes of the action further requires many actions and several simple manipulations are needed under that action.

## **5. Conclusion**

This study is to find a methodological model for game analysis focusing on game play, which is unique to game. To this end, we have examined seven layers of the existing analytical models of Konzack (2002) and compared them with those of other researchers[13].

The modified model defines the process of game play as 'a series of repetitive yet changing process of achieving and evaluating goals while interacting with the player and the game space.' Such gameplay has been divided into the 1) 'game-environmental context,' 2) the 'game-world context': goals, rewards/punishments, knowledge or information, challenges (time constraints), and the 3) 'game-structural context': the player's location, space and resources, respectively.

The analysis of game-environmental context is useful for the study of socio-cultural perspective, and the research method can select the social science method according to the study purpose. The game-world context analysis is seen as a necessary analysis to find patterns of gameplay, however, the specific method must be reinforced with the theory. The analysis of the game-structural context is a context by which one could obtain meaningful results even if performed independently. In particular, the 'resource' factor is exactly the same as that of Dutton & Consalvo (2006)[8]. The component of 'space' will be helpful to read the structure and change of the whole game if it is compared with the game-world context.

In addition to the narrative analysis, the game-world context and the game-structural context in the inductive game analysis were analyzed, and it was conclusively concluded that "entering space – granting mission – achievement - again". If the game-world analysis were performed with a focus on the game play, it would be possible to analyze the unique play pattern and, hence, the pattern change of each game.

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