

## **A study on an Analysis of Success Factors by Production Process of a Serious Game for the Elderly: Focusing on an Arcade Game “Anti-Aging Village”**

Hyungsup Yoon<sup>1</sup>

<sup>1</sup>Dept. of Game Studies, Graduate School, Sangmyung University  
[quesera21@gmail.com](mailto:quesera21@gmail.com)

**Abstract.** This paper is a case study for serious game to derive key success factors by production process. So I selected an arcade serious game for the elderly, named “Anti-aging Village” according to the criteria. After analyzing a serious game for the elderly by production process I found some key success factors by as follows: First, they had understood enough the state of growing elderly population in South Korea and designed gameplay well for improving cognitive function for the elderly. Second, they organized a development team including some experts and made use of the feature as a RF card. Third, they validated the effectiveness of a serious game through clinical trials and play test. This paper will help for serious game design and could be the guideline for the development of serious game for elderly.

**Keywords:** Game Design, Serious Game, Game Analysis, Game for Healthcare, Game for Cognitive Skills

### **1 Introduction**

Serious games are computer or video games designed for a primary purpose other than pure entertainment, but have other and more “serious” purpose.[1] According to ADATE 2012 report, the world market for serious games is up to € 2.35 billion in 2011, and to show annual growth of 70% was expected.[2] However, serious game market in Korea, unlike the report not being activated. The market for Serious Games in South Korea is not yet activated. There are in both sides demand and supply. In terms of demand there are some reasons, low awareness for serious games, distrust for potential effect for serious games and negative perception for video games. Also in terms of supply there are some reasons, low quality of serious games for consumers, effect of serious games is not sufficiently validated and not good user interface and so forth. The purpose of this paper analysis the game design elements and consideration by production process focusing on an arcade serious game “Anti-aging Village”. So this case study on an analysis of key success factors by production process of a serious game for the elderly will help for serious game design and could be the guideline for the development of serious game for elderly.

## **2. An Analysis of a Serious Game for the Elderly by Production Process**

### **2.1 Selection of a case study game**

I selected a game for case study as follows; recently developed serious game with award-winning, with a number of media exposure, with innovation so aimed new market and easy accessibility of data and so forth. “Anti-aging Village” is an excellent serious game in South Korea, takes more than a billion of research and development costs. A game developer Uniana co. Ltd which is specialized arcade game since 1988 and medical consultant hospital Hyundai did collaborative research and development. The clinical research trials was passed by IRB(Institutional Review Board) and got the official approval. Also the games were installed in 25 Centers for Welfare over the country and receive user feedback on the effect of the serious game “Anti-aging Village” from 100 seniors.

### **2.2 The Methodology of analysis**

I make use of methodology of case study step-by-step analysis of the game in this study. This research method is so subjective and qualitative, and has limitations. So I complemented by using clinical trials and its results, the validation study for effectiveness of serious game for more objective and quantitative research.[3] Also I interviewed twice a director who was directly involved in the research and development and experiment. So I was able to analyze the serious game from different angles.

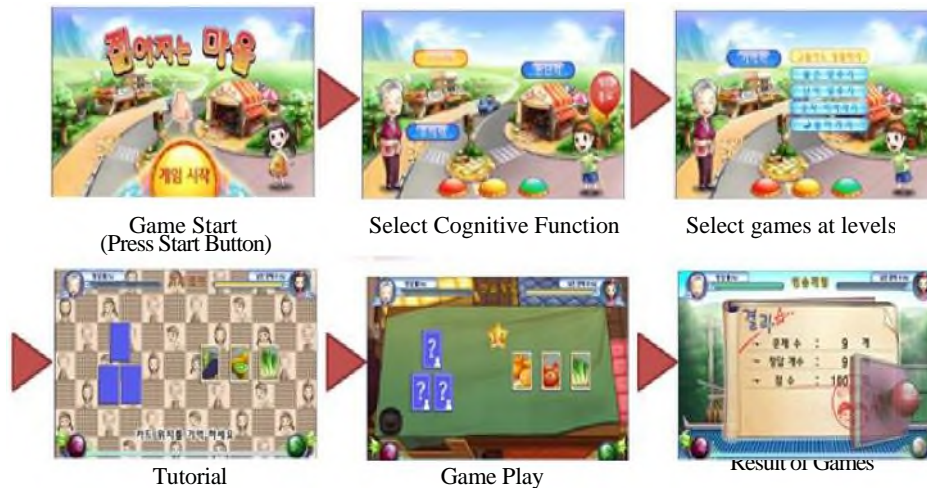
## **3 An analysis on the key success factor of Serious Game “Anti-aging Village” by production process**

Serious games need a lot of collaboration with experts and have to be validated for its effectiveness. I’ll analyze the key success factors of serious game “Anti-aging game” by production process in this paper. So I divided the development process into three steps “pre-production, production and post-production” and analyzed them by each step.

### 3.1. Introduction of “Anti-aging Village”

Title	Anti-aging Village
Genre	Serious Game for the Elderly(esp. Training Game for improving Cognitive Function in Dementia)
Platform	Arcade
Target Audience	Over 65 years(for the Elderly)
Kinds of Gameplay	9 kinds of gameplay, 5 <sup>th</sup> Level at each game
Player Type	Single(Not network paly)
Period of Development	18 months(Apr. 2011 ~ Dec. 2012)

### 3.2 Gameplay process



### 3.3. Features of the Game “Anti-aging Village”

Platform	Select as arcade game for the accessibility for the elderly, not PC or Smart phone game
Characters	Set the character not too old(Most of the elderly do not tend to admit themselves are old)
Back ground Story	Players can go back 30 years ago, and go around the town with their grandsons in a variety of situations.
Sound and Effects	Use the classic and traditional music for helping concentration
User Interface	Set UI as simple as possible considering their cognitive abilities
Hardware	Make corner rounded for safety

### 3.4. Key success factors in stage of pre-production

#### 3.4.1. In the Step of Research for demand

- They(Development Team) focused the rapid increase of the elderly in South Korea. And the number of dementia is increasing rapidly. The elderly population is increasing by 12.2% in 2012, and expected to reach 20.8% in 2026 [4].
- They decided the platform and gameplay for improving cognitive function for the elderly.
- They forecast B2B model is preferable considering the situation in which the elderly should bear the cost of treatment of dementia because of lack of a national management system in South Korea.

#### 3.4.2. In the Step of Planning

- They decided a serious game for improving cognitive functions while having fun.
- They designed a gameplay for improving 3 major cognitive functions: attention, memory and judgment with the medical experts.

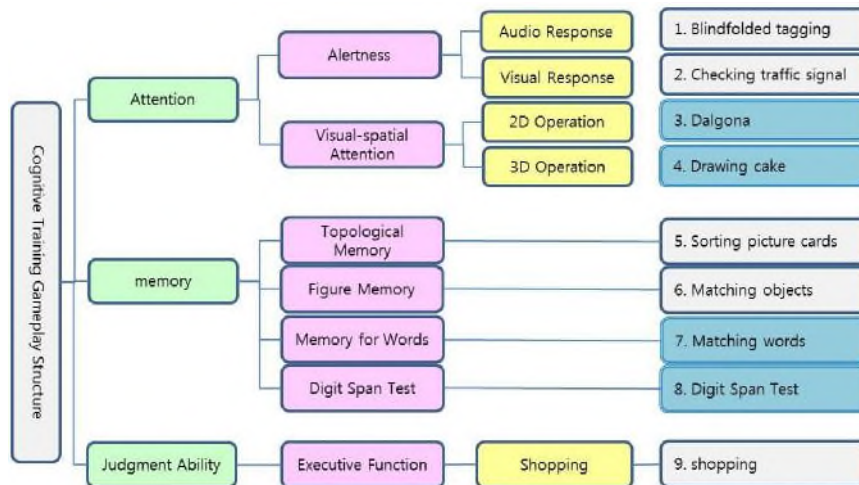


Fig. 1. Cognitive Training Gameplay Structure

### 3.5. Key success factors in stage of production

- They constructed effective development team including medical experts and experts group for the elderly.
- They prepared RF(Radio frequency) card and server system. So the game machine could identify the game player and save the record of personal gameplay and check all the player statistics.

- All the statistics of the gameplay could help update game and serve information for welfare policy development for the elderly.



**Fig. 2.** Organization and Roles in the Development and Advisory

### 3.6. Key success factors in stage of post-production

#### 3.6.1. Clinical research trials and approval

- The clinical research trials was passed by IRB(Institutional Review Board) and got the official approval.
- Also the games were installed in 25 Centers for Welfare over the country and receive user feedback on the effect of the serious game “Anti-aging Village” from 100 seniors.
- They could confirm that cognitive function is improved through play test.



**Fig. 3.** A scene of clinical trials



**Fig. 4.** A scene of analysis of experimental data

**Table 1.** Degree of cognitive improvement through play testing(No. of samples: 101)

•	• Sex	• Before After		• <i>t</i>	• <i>p</i>
		• average	• Standard Deviation		
• Score of Cognitive Functions	• male	• -0.48	• 1.62	• -1.61	• .119
	• Female	• -0.51	• 1.47	• -2.90	• .005
	• Total	• -0.5	• 1.51	• -3.32	• .001

- They confirmed that the speed and difficulty of gameplay is suitable for the elderly through play test.

#### 4 Conclusion

This case study on an analysis of key success factors by production process of a serious game for the elderly was performed through strict clinical trials and play test. So I found some key success factors by production process as follows: Each stage of production has some key success factors. First, they had understood enough the state of growing elderly population in South Korea and designed gameplay well for improving cognitive function for the elderly. Second, they organized a development team including some experts and made use of the feature as a RF card. Third, they validated the effectiveness of a serious game through clinical trials and play test. But this paper has limitations as a case study. And this game is in the previous step before commercialization yet. Thus additional research for success factors of serious game since commercialization will be necessary.

#### References

1. Ritterfeld U., Cody M., Vorderer P.: Serious Games: Mechanisms and Effects, Routledge, pp. 3-9, (2009).
2. Korea Creative Content Agency, Serious Game Status and Promotion Strategies, Research Report 13-11, pp. 47.
3. Doh Y. Y.: A Systematic Approach to Evaluate Player's Experience. Serious Game Research Forum Seminar proceeding, (2013).
4. Ministry of Health and Welfare, Korea Institute for Health and Social Affairs, 2011 Senior Survey.