A Study on Promotion Plan for Korean Virtual Reality (VR) Game Industry

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Abstract—VR technology brought a new turning point to the game industry. Through the convergence with suitable content, it is expected to further advance the technical features of the game platform. Moreover, as a next generation game platform, it is also expected to change the landscape of the market by bringing new experiences and competition between global H/W and S/W companies. However, because of high uncertainties, major game developers are being reluctant to make huge investment and Korean game developers are being inactive in developing new games.

Therefore, for the game industry to regain its competitive edge in the VR platform, it should be supported by strong policies that can improve the environment of the industry.

Keywords—VR game; game contents; dizziness; contents-platform-network-device.

I. INTRODUCTION

Game industry whose most value exists in digital forms is a next generation industry of high added value and high inducement effect on employment. Particularly, this industry is where convergence of new information and communication technology (ICT) such as Cloud and virtual reality (VR) takes place very actively and thus growth potential is huge. Although mobile game has settled down in the center of Korean game industry since 2010, it is becoming red ocean at a very rapid rate due to increasing cost of production and marketing and aggressive marketing of overseas game companies. Notably, Chinese enterprises expand investment and M & A in Korean game industry, setting its solid stance while they develop game development competence rapidly, which gradually narrows the gap with Korean game developers.

In this situation, Pokemon GO, which is an augmented reality (AR)-based game, has recently been launched. It is not only generating share value, but also affecting various aspects of our economy. Like this, platform business model that is the base for exclusive supply of new goods or service functions as a core competitiveness in itself and is expected to expand to manufacturing sector beyond internet service business.

In particular, since Korea has high competitive human resources in international game market and solid infrastructure of information and communication technology, investment in R&D, which directly results in fruits, should be preconditioned to securing core competitiveness of new growth drive such as platforms business model-based virtual reality (VR) superior to virtual reality (VR).

In this respect, the present study examines policy status related to VR, the problems and challenges, and strategic supportive measures in order to better understand the promotional policy of virtual reality game industry, and draws out a direction to proper policy and finds core factors in order to popularize VR.

II. POLICY STATUS OF VIRTUAL REALITY GAME

As the Korean mobile game market has entered a mature stage, attention is being paid to the contents of virtual reality. Rapid expansion of virtual reality technology is attributed to rapid growth of ICT-related technology and change in the environment of content development and production. In particular, because it is highly likely that virtual reality is going to apply to various industries including education, e-commerce, and healthcare industry, going beyond entertainment market like game, movie, sports, and entertainment park, it is expected that its ripple effect will be considerably great on related markets.

The promotional plans of the government for game and virtual reality industry include 1) development of tangible game contents, 2) legal relaxation on game industry, and 3) expansion of game industry into overseas markets, and 4) building the base of sustainable growth for game industry [3].

To foster next generation contents, national R&D investment is focused mainly on tangible game contents such as virtual reality (VR), functional game contents for e.g. health and education sectors, and such sectors of high growth potentiality like game artificial intelligence (AI), and concentrates on technology in virtual environment, bio-information analysis, customization (or personalization), learning-purpose character, and game big data emphasis.

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Table 1 shows the budget size of 5 VT flagship projects (VR services platform, VR game-experience, VR theme park, multi-sided screening, and educational distribution): it is 61.65 billion KRW in 2016 and a total investment of 189.95 billion KRW is budgeted for the next 3 years (2016 – 2018) [3].

Table 1. Budget Necessary to Create New Markets of Game Industry

<table>
<thead>
<tr>
<th>Investor Sector</th>
<th>5 Leading Projects</th>
<th>Convergence Base of Culture and ICT</th>
<th>Source-Based R&amp;D</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>14.9</td>
<td>12.55</td>
<td>18.1</td>
<td>45.55</td>
</tr>
<tr>
<td>Private</td>
<td>10</td>
<td>-</td>
<td>6.1</td>
<td>16.1</td>
</tr>
</tbody>
</table>

III. BARRIERS TO POPULARIZATION OF VR GAME

Korean game industry fails to create VR business or profit model based on partial payment system except some of chargeable VR contents because VR devices have not been popularized enough to bring VR games deep into the public and generate economic profit out of it. Like this, Korean VR game industry has a lot of barriers and challenges to tackle. It indicates that it is very necessary that a variety of menu game consumers can choose be prepared for VR industry to make a soft landing.

A. Inherent Problems to VR Device

While virtual reality devices are being paid high attention, it is pointed out they have problems with resolution and cognitive dissonance.

1) Peripheral distortion of fish-eye lens
2) Visibility is secured and cumbersome hardware (weight and inconvenience) is tackled by optical distortion
3) Problems of PC / Android VR devices
   a) Generation of high heat and rapid battery rundown
   b) Insufficient contents and inconvenient installation and operation of equipment
   c) Expensive hardware
   d) Limited to PC specification and compatibility
   e) Nausea / dizziness
4) Inevitable problems that cause nausea and dizziness
   a) Visual-spatial mismatch
   b) Discrepancy between VR space and your vision
   c) VR theme park: attempt to match real physical space with VR space
   d) VR coaster project: synchronization of real space and VT device
5) Inherent problem of VR device: it needs a PC whose graphic performance should be 7 times greater than even high-performance PC (7 times as high as pixel/s of a high-performance PC).

B. Problems in Development of VR Game

Although its contents seem synchronized only with software, in fact, VR can provide contents through hardware. VR technology is still not perfect. Therefore, it is necessary to focus on the development of virtual reality contents in an earnest manner by pioneering VR game genres and sharing predictable problems that have been found in trials and errors.

1) A sense of resistance due to imperfect hardware and dizziness accordingly, and short play time, etc.
2) Anxiety of market not expanding and absence of development community
3) Peripheral distortion and blurring
4) Problems of VR exclusive UI/UX - peripheral placement of UI components and text of low readability
5) Keyboard and mouse hard to apply to MMORPG game
6) Problems of making VR game along changing camera angles
7) Problem with the characteristics of VR game genre (moving camera and nausea caused by it)
8) It is necessary to establish the environment of development suitable for various games and user’s characteristics by effective configuration and combination of UI/UX.

C. Solution to the Development of VR Game

The most priorities should be placed on developing contents suitable for a new type of VR game rather than existing game genres and solving the problem of dizziness. In addition, it will be needed to provide a new VR solution based on a logic that can maintain maximum FPS (Frame Per Second) performance and game play exclusive for VR.

1) Optimal design of continuous screen rendering path rather than the performance of VR device
2) The problem of strategic cross-platform market that simultaneously supports a variety of hardware platforms with a single content
3) Reduction of motion blur, minimum use of screen effect, securing optimal frame, and real-time raytracing
4) Separating object UI from screen UI (UI using 3D object, UI placed at the center of environment HUD screen: HUD)
5) Development of UI/UX suitable for VR - composition of HUD, Lobby, and Menu
6) Sensor and position tracking, camera production using head tracking – the 3rd person RPG
7) Camera movement (Camera Cut Scene) and level composition fit to VR – the 3rd person RPG
8) Simplified game rules for minimal composition of UI in response to VR, Non-VR or mobile version. It is a principle not often applying to general UI/UX design or design guideline, but it can be applied to an excellent interaction design.
IV. POLICY FOR PROMOTING THE DEVELOPMENT OF VR GAME

Because content firms are shifting their business toward VR sectors, but take a passive attitude to investment due to the uncertainty of market demand and no success case yet, measures were taken to create the early markets of VR contents by supporting the overall aspects of VR including VR content planning, production, R&D, finance, human resources, etc. In addition, efforts were made to develop the success cases of VR contents and to expand contact points where general consumers can experience VR directly.

Moreover, it is urgent for the government to establish systematic support policy and settlement support to respond fast-changing VR industry initiatives to create new markets for VR, seeing VR content industry as global culture-ICT convergence industry, by making an enough and active investment in VR-related R&D, reinforcing the expansion of small and medium game companies into overseas market, supporting R&D for VR source technology and content application technology, exploring demand-generating large projects, preparing user guideline of VR contents, establishing safety management system for VR game, and relax VR-related regulations.

A. What Should We Do with VR?

Although the growth momentum of VR is not significant, opportunity is clearly found in its huge potential market. The government should lead VR industry by running government-led business and developing VR platform so that VR devices and equipment can spread and a business mode of integrating software, contents, and devices can be created. It should step further to balance the development of VR devices and contents through mass-production of competitive devices, establishment of environment for developing in-house content app, activation of VR-related start-ups, and collaboration with global firms, rather than too much focusing on the support of VR content production and application.

1) We all have to join force together to promote new markets (expanding market size and consumer pool)
2) Ready for long-term competition
3) Make VR and non-VR version at the same time to secure popularity
4) Support the development of convergence contents of VR and AR
5) Create VR ecosystem of C-P-N-D (contents- platform-network-device)
6) Directly target North American market and European market
7) Aim for additional business items at the same time

B. Building Infrastructure for VR Game Development

Since VR business mode has been set in a way that VR operators purchase a small number of VR and provide specialized services to a large number of customers, it paradoxically makes it hard to draw out people’s demand for VR at an explosive rate. It may disprove the evidence that consumers can directly purchase VR or it indicates that it is very necessary to understand overall VR ecosystem and arrange it to make the market grow together and mutually. And to popularize VR, it is needed to simplify the value chain of production-distribution-consumption of VR game and accelerate compatibility of VR with smartphone-based device.

1) Supporting the development of VR game by genre and stage in connection with activation policy for existing game industry to increase Korean game market; industry activation through policy business advancement by development corresponding to industry demand and fostering planning manpower; and a promotion plan for financial investment.

2) Expanding the opportunity of experiencing VR contents to build and spread contact points with VR; offering high-quality contents that can meet the expectations of early-bird users; increasing VR efficiency and usability by connecting with virtual reality experience zones and VR exclusive space.

3) Inducing the blossoming of development market of VR games; providing supportive business and design for VR game and content development; researching and sharing VR-related global trend on regular base; providing basic conditions for the activation of (incubating) VR game development [4].

Figure 1 shows strategic direction and system acceding to setting key strategy for activating VR game development and Figure 2 shows the current status analysis and corresponding direction to create new market of game industry [3].
V. CONCLUSION

The Korean game industry has rapidly grown focusing on online games and mobile games, but prolonged recession of world economy and saturated game market curbed the growth rate considerably. Meanwhile, major ICT companies such as Facebook, Sony, Google, and Samsung versioned VR as a new growth drive and have taken progressive initiatives in developing VR-based platform. Although it is estimated that VR game will have been limited to some gamers due to expensive equipment and inconvenience of wearing HMD (Head Mounted Display) for the time being, middle-size and independent Korean game developers are positively expected to develop VR games on the ground of their early start for VR game development, enough graphic resources and high level of development competence, and the presence of VR device vendors easy to connect with.

VR is highly expected to connect to arcade games based on theme park, using VR headset and motion recognition sensors. To lead the generation of new content services, in addition, VR game business should be directed to playing a role of hub for the ecosystem of cultural content (entertainment) industries and reinforcing the synergy of core growth drive to create added values by active connection with other content industries including broadcasting, movies, music, and performing.

REFERENCES