Computer Science and Information Systems 21(2):525–545 https://doi.org/10.2298/CSIS221117009L

An Empirical Study of Success Factors in Korea's Game Industry

Jun-Ho Lee[1], Jae-Kyu Lee[2], and Seung-Gyun Yoo[3,*]

[1] Division of Public Affairs and Police Administration, Dongguk University-WISE, 123, Dongdae-ro, Gyeongju-si, Gyeongsangbuk-do, 38066, Republic of Korea
juno@dongguk.ac.kr
[2] Department of Information Management, Dongguk University-WISE, 123, Dongdae-ro, Gyeongju-si, Gyeongsangbuk-do, 38066, Republic of Korea
duckjk89@dongguk.ac.kr
[3] Department of International Trade and Airline Service, Dongguk University-WISE, 123, Dongdae-ro, Gyeongju-si, Gyeongsangbuk-do, 38066, Republic of Korea
bluetrade@dongguk.ac.kr

Abstract. Korea's game industry is enjoying remarkable growth along with China and Southeast Asia. This study proposes and analyzes the relationships among characteristics of the basic environment, such as management, technology, marketing, and industry trends, among Korea's game companies. Through this analysis, game companies can attempt to achieve growth and expansion into global markets. From this study, these achievements can be made through leadership in technological development, by identifying competence in managers, and from awareness of the trends in markets and the game industry. Securing intellectual property rights to sustain performance and market expansion is one of the most important strategies in the game industry. In other words, the performance of a game company depends on the ability of managers to provide the newest story and user services, and to apply research and development in technology, marketing, and related industries. Because previous research has focused on the external aspects of games, including their effectiveness and impacts, this study differs in that it comprehensively considers internal aspects of the game company, the market, and the industry. This study explores the key success factors for improving corporate performance in Korea's game industry by setting up environmental, strategic, and performance models to investigate relevant factors. We also parameterize the market adaptation and R&D functions of companies. Through this research, we expect to support strategic decision-making in the game industry and contribute to enhancing the performance of game companies.

Keywords: Game Industry, R&D, Intellectual Property, Performance, Adaptation.

* Corresponding Author

1. Introduction

The game industry has expanded with the development of computers. Due to the influence of the Internet, which has increased since the 1990s, the game industry has moved away from time and space constraints and has become a global industry. Through its recent combination with virtual reality, the game industry is perceived as a business with a low risk of failure, unlike other cultural industries. In particular, it has become a culture beyond simple leisure activities through a combination of knowledge and technology.

Gaming is a comprehensive industry that encompasses various fields. This makes it a high value-added knowledge industry that has both cultural and industrial characteristics in movies, broadcasting, characters, and advertising. Just like other industries, it is important for the gaming industry to gain market leadership to improve performance. These initiatives stem from a variety of strategies that apply and extend the enterprise's internal and external capabilities.

The nature of knowledge-based industries recognizes the rights that can be obtained with new technologies and knowledge, because property rights are recognized as management resources of an entity through legal rights and protection schemes. In other words, companies are expanding their intellectual property rights and enhancing their competitiveness through research and development.

The fourth industrial revolution (Industry 4.0) strengthened the technical characteristics of the game industry through factors such as AI, deep learning, and big data. These environmental changes have led to the protection of intellectual property rights and patent rights. Industry 4.0 has also enhanced corporate performance by increasing profit through marketing activities.

A company's marketing serves as a driving force to improve performance and expand markets. Achieving standardization through continuous technology development can reduce costs and expand user services. Moreover, various activities enhancing management performance, such as a differentiation strategy, improvement of the distribution structure, and establishment of service centers, have made the game industry independent. Even though COVID-19 is causing a slowdown in the global economy, gaming remains a growing sector. The game industry is creating a virtual world that is interconnected through online access. Growing enterprises have significant success factors. By analyzing these success factors, we can identify factors that drive corporate growth. However, few studies have explored success factors in the game industry.

The purpose of this study is to explore the success factors for improving corporate management performance in Korea’s game industry. Through this, differentiated strategies and growth plans are identified that could help companies in the game industry looking for new growth engines. It is also meaningful from the fact that this research has been conducted in terms of management and strategy.

To this end, this study explores relevant factors by setting up environment, strategy, and performance models. The performance of enterprises was analyzed by setting management, technology, market, and industrial factors as environmental variables. A company's market adaptation and R&D capabilities have been parameterized.

In Chapter 1, the significance and expansion of the gaming industry are elucidated. Additionally, the criticality of innovations and market adaptability within the gaming industry is discussed, with the research objectives being delineated. Chapter 2 delves

into extant literature concerning the trends and determinants of success in the gaming industry, elucidating its linkage and differentiation from prior studies. Chapter 3 delineates the research objectives, posits hypotheses, and introduces the research framework. The methodology, encompassing data collection and analytical techniques congruent with the research aims, is also expounded. In Chapter 4, the amassed data is systematically analyzed, and the research outcomes are presented. Chapter 5 discerns the factors of success based on the analytical findings and proffers insights pertinent to innovation and market adaptability in the gaming sector. Lastly, Chapter 6 encapsulates the research's conclusions, highlighting its limitations and suggesting avenues for future inquiry.

2. Trends and Prior Studies in the Game Industry

2.1. Trends in Korea's Game Industry

Games create value in terms of economics, merchantability, and diligence through the combination of software and hardware. Gaming is a knowledge-based industry in which high value can be achieved even from a small amount of capital investment, and it is an industry that can create synergy by merging with other industries. In addition, gaming is largely divided into hardware-oriented markets (e.g., PC games, mobile games, console games, and arcade games), commodity production (e.g., software, characters, and peripherals), and service providers such as PC rooms and complex game venues.

Table 1. The Size and Prospects of Korea's Game Market (2017-2021)

(Units: 100 million won)

Division	2017		2018		2019 (E)		2020 (E)		2021 (E)	
	Sales	Growth (%)	Sales	Growth (%)	Sales	Growth (%)	Sales	Growth (%)	Sales	Growth (%)
PC Games	45,409	-2.9	50,236	10.6	51,929	3.4	53,210	2.5	52,399	-1.5
Mobile Games	62,102	43.4	66,588	7.2	70,824	6.4	72,579	2.5	76,757	5.8
Console Games	3,734	42.4	5,285	41.5	5,467	3.4	5,334	-2.4	7,042	32.0
Arcade Games	1,798	121.0	1,854	3.1	1,908	2.9	1,881	-1.4	1,992	5.9
PC Rooms	17,600	20.0	18,283	3.9	19,879	5.6	19,879	2.9	19,527	-1.8
Arcades	780	4.0	686	-12.0	691	6.5	691	-5.5	703	1.7
Total	131,423	20.6	142,902	8.7	153,575	5.1	153,575	2.3	158,421	3.2

Source: Korea Creative content Agency, WHITE PAPER ON KOREAN GAMES 2019, p.5.

Korea's game market continues to grow in console games and mobile games. In particular, most game segments showed marked growth in 2017. This indicates that the

combination of game-related hardware and content has resulted in completion of the growth engine (Table 1).

Considering the trend in international trade for Korea's game industry, the export sector continued to grow from US$2.6 billion to US$6.4 billion, but imports increased by between US$180 million and US$300 million.

China had the largest share of all trading partners for Bishop Games Studio, inc., followed by North America and Japan. What is noteworthy is that the proportion of imports and exports for the Chinese region and other regions are in contrast to each other, which is believed to be due to the different characteristics of game stories and the local game infrastructure. It also shows that game companies need to identify these market characteristics and local technical and potential needs (Table 2).

Korea's game industry has a global market share of about 30%. Among them, PC games and mobile games have a high proportion due to the development of domestic IT technology, consumer marketing, and gaming market managers' capabilities (Table 3).

Table 2. Import and Export Status of Korea's Game Industry

(Units: US$1,000)

Division		2012	2013	2014	2015	2016	2017	2018
Export	**Export Amount**	2,638,916	2,715,400	2,973,834	3,214,627	3,277,346	5,922,998	6,411,491
	Increase/ Decrease (%)	11.0	2.9	9.5	8.1	2.0	80.7	8.2
Import	**Import Amount**	179,135	172,229	165,558	177,492	147,362	262,911	305,781
	Increase/ Decrease (%)	-12.6	-3.9	-3.9	7.2	-17.0	78.4	16.3

Source: http://www.kocca.kr/cop/bbs/view/B0000146/1841389.do?menuNo=201826&delCode=0&pageIndex=1, Search May 27, 2020.

Table 3 Global Market Share for 2019

(Units: US$1 million)

Division	PC Game	Mobile Game	Console Game	Arcade Game	Total
World Game Market	32,807	63,884	48,968	32,709	178,368
Korea Game Market	4,566	6,049	480	231	11,326
Share (%)	13.9	9.5	1.0	0.7	6.3

Source: Korea Creative content Agency, WHITE PAPER ON KOREAN GAMES 2019, 2019, p.26.

2.2. Prior Studies

Game-related research has been conducted from technical aspects (e.g., IT and programs), but research into the game industry in terms of corporate performance is rare.

Park understood the game industry by linking it to content, arguing that to enhance corporate performance, it is necessary to converge family-oriented content strategically with content syndication, IT and story combination, and consumer-led content development. That study also stressed the need for market-adaptable corporate management to spread game platforms [55]. Kim predicted that the future of the game industry would emerge from genre specialization, technology monopolization, and the expansion of online games, noting that collaboration between companies, securing professional technical personnel, and marketing can determine performance in the game industry [28].

Choi et al. argued that the game industry should be fostered through value chain models. They stressed the importance of distribution through the global value chain, suggesting that growth of the game industry has increased significantly in the entertainment sector. They emphasized the need for development tailored to cultural background and market consumer characteristics in order for Korea's game companies to enter global markets. The marketing and management aspects of companies, such as Chinese consumers' preferences, distribution networks, market customs, and service management, are important if Korean companies try to enter the Chinese market [68].

Oh and Kim suggested measures to enhance corporate performance through environmental and industrial factors. They found that environmental factors such as consumer sentiment and related laws on games, market distribution structures, and industrial factors such as R&D, facilities, and marketing should be overcome. To this end, the Commission requested cooperation among businesses, the sharing of distribution networks, and government support to establish infrastructure for the game industry [54].

Factors such as corporate research and development investment and corporate performance have a causal relationship with patented technology[29, 38, 42, 56], and patent information well represents the technical ability to link corporate research and development investment, innovation activities, and corporate performance[16, 40, 49, 71]. Additionally, the realization of reality by computer technology has begun to provide a degree of reality to things like traditional card games, Go, and chess, and to activities like flying a fighter jet, firing missiles, and exploring space[22, 35, 60, 73].

Lee and Huh pointed to a need to foster the game industry through the introduction of industrial technology, and through management and administrative perspectives from an interdisciplinary point of view. They showed that various institutions and government support are needed for the development of certain industries [39]. Jung et al. argued that government policy support is important to small game companies in order to address their lack of technology. They proposed a government funding and technology evaluation system as an improvement plan, and demanded government support for the game industry, which requires continuous R&D [24].

The game industry requires not only continuous R&D investment but protection of intellectual property rights such as patents and copyright. In particular, Choi et al. showed that government support could raise R&D spending and patent registrations by firms [68].

Ayaz and Li argued that consumer preferences and user demand are indicative of R&D, and taking them into account can lead to an increase in corporate performance. This shows that R&D is a major factor in gaining a competitive advantage, helping companies grow and expand their market share [4].

Lee et al. looked at R&D activities based on the size of the enterprise. Their findings indicated that the larger the company and the higher the sales, the more likely they are to engage in R&D activities and secure property rights. This shows that expanding the size of game companies and/or collaboration among them is a way to secure competitiveness [40].

Koo stated that when firms are willing to spend on R&D and when internal capabilities are well-equipped, if technology procurement is internationalized, then corporate performance is positive. In addition, the characteristics of corporate managers and overseas market activities have a positive impact on R&D performance, and overseas collaboration and marketing have a positive impact on corporate performance [37].

Liu and Kwon explored the difference between the content business and the entertainment business in terms of corporate performance. Because the nature of knowledge is strong in the content business, the willingness and management strategies of corporate managers are important, and in the entertainment business, the improvement of R&D and market adaptation is more likely to enhance corporate performance [45]. This encourages relatively small businesses to expect aggregation through M&A for qualitative development. They also proposed multi-use management through the establishment of a consumer-oriented game network and distribution platform, rather than a supplier-oriented management method.

The investigation into the proportion of patent value to a country's total research and development investment has verified that factors such as corporate research and development investment and corporate performance have a causal relationship with patented technology. Technological innovation often utilizes patent data to measure the direction of spillover effects, and the spillover effects of technological innovation include the social benefits from ideas or information resulted from research and development investment and the non-competitive goods affecting other research[2, 8, 15, 29, 41, 45].

Choi et al. claimed that the establishment of a platform for item trading through an analysis of the game market affects the performance of game companies. They stressed the need to develop a transaction-based platform based on a Chinese market analysis, which should lead to market-oriented corporate management, including consumer-oriented marketing strategies and market distribution [68].

Goyal pointed out that the world's top companies have read the future of the game content industry and have invested in R&D. In addition, online payment can improve the game industry's performance, and online payment systems need to be overhauled through R&D [71]. Choi et al. called for technology development to improve performance, referring to managers' abilities to apply new technologies such as mobile payment platforms and to adapt to market trends in corporate competitiveness [68].

3. Hypotheses

3.1. Managers

The internal environment of a company is a controllable area. In particular, various studies have identified the ability to enhance corporate competitiveness through human resource management [4, 18, 24, 36, 44, 49, 50]. In addition, corporate managers' global interests and capabilities lead to government support, and affect adaptations to local markets and R&D [40, 64].

In terms of a strategy for enhancing a company's performance, manager-related characteristics have an impact [2, 6, 10, 11, 16], and empirical studies have shown that management's characteristics have a significant impact on innovation activities [32, 50, 75].

Therefore, the experience, attitudes, and know-how of game company managers influence R&D activities when adapting to local markets using marketing to strengthen market share.

H 1-1 Manager competence will have a positive effect on market adaptation.

H 1-2 Manager competence will have a positive effect on R&D.

3.2. Technology

Technology in the game industry is a very important means of enhancing competitiveness. A corporate entity may have technical capabilities by developing technology on its own or by purchasing it. In particular, companies with professional resources have a high R&D ratio, and property rights are actively protected [14, 20, 21, 42, 47, 67].

In particular, a company is able to drive changes in the market by advancing the industry with improved technology and by improving infrastructure, securing a competitive advantage through its value chain [37, 41, 70].

Therefore, the technology and the technical professionals of game companies can pursue market changes, strengthen market adaptation, and influence R&D activities to improve performance.

H 2-1 Technology factors will have a positive effect on market adaptation.

H 2-2 Technology factors will have a positive effect on R&D.

3.3. Markets

The game industry has different technology levels and growth rates depending on the size of the market. Domestic and overseas markets differ in size, sales, and consumer preferences [62, 74]. Markets with high-income consumers are well-equipped with laws and systems, and respond quickly to technical demand [3, 49, 60].

Additionally, consumer preferences increase the demand for items with a related technology [5, 11, 52, 72, 63].

Strategic choices and the necessary R&D activities will vary depending on market factors such as when products are released, product levels, and customer satisfaction. In other words, game companies should implement various forms of marketing according to consumer demand [15, 46, 51].

Therefore, companies adapt to the market according to positive market conditions, such as game recognition, institutional devices, and the level of market competition, strengthening the R&D capabilities needed.

H 3-1 Market factors will have a positive effect on market adaptation.

H 3-2 Market factors will have a positive effect on R&D.

3.4. The Industry

The game industry consists of small and medium-sized enterprises engaged in various activities such as planning, development, storytelling, and distribution. This shows that industry growth can bring about corporate growth. Recognition from the industry is particularly important in the early stages of products offering new technologies to meet consumer demand [27, 29, 30, 44]. However, due to consumer loyalty and market infrastructure in the growth phase of a product, there is a strong tendency to make conservative choices rather than novel ones [9, 15, 73].

Regulations and support for R&D and marketing activities vary depending on the industry [33, 36, 57]. In industries where management resources can easily be combined, the phenomenon of a shared economy through strategic networks and synergies through marketing and R&D activities can be expected [22, 48].

Increasing performance in the gaming industry requires a consumer technology and platform that integrates tightly with time of product release onto the market [12, 69].

Therefore, the industrial environment, such as distribution, government support, and market entry barriers, has a positive impact on a company's market adaptation and R&D.

H 4-1 Industrial factors will have a positive effect on market adaptation.

H 4-2 Industrial factors will have a positive effect on R&D.

3.5. Adaptation and R&D

The ability to execute marketing that is tailored to local consumers and intended to increase demand has a significant impact on corporate performance [41, 58, 56]. Performance improvement through government support and market systems [7, 8, 26, 34, 35, 44, 49, 53, 58, 60, 61] along with active funding and technology evaluation systems in the market enable performance improvement beyond the company's scale constraints [27, 29].

Game companies can seek continued market competition and market leadership by investing in R&D, which has a positive impact on corporate performance by securing intellectual property such as technological innovations and patent rights [25, 33, 36, 57, 59].

Therefore, market adaptation and R&D, such as enterprise marketing activities and consumer preferences, have a positive impact on management performance.

H 5-1 Market adaptation will have a positive effect on management performance.

H 5-2 R&D will have a positive effect on management performance.

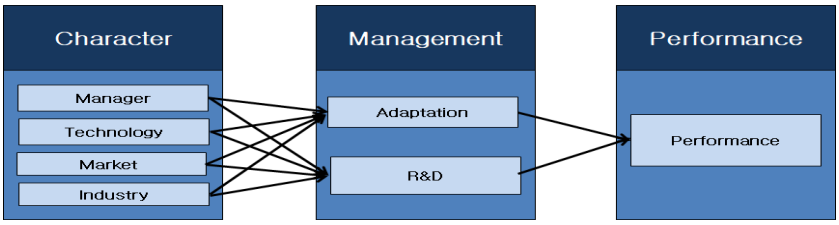

Fig. 1. The research model

3.6. Data Collection

This study surveyed companies in Korea's game industry. The method of selecting the companies to be surveyed utilized the list of companies registered in the Game Marketing Forum (an Internet gathering of the Korea Game Industry Promotion Agency, the Game Developers Council, game company marketing companies, and distributors).

The data included interviews with the person in charge, plus e-mailed and direct surveys of game companies that joined the game association.

From May 25 to August 25, 2019, 900 copies of a questionnaire were distributed via e-mail and given offline via interpersonal interviews and group interviews (Table 4). After 350 responses were collected (a response rate of 38.9%), 336 were used for the study, excluding 14 that were incomplete.

Table 4. Sample Aggregation of the Questionnaire

Division	Online		Offline		Total		
Companies	Targeted	Answered	Targeted	Answered	Targeted	Answered	Response Rate
	150	150	750	200	900	350	38.9%

4. Research Results

4.1. Characteristics of the Sample

1) Major activities of game companies

The scope of the development, distribution and service offerings, and planning activities cited by game companies were 37.8%, 25.9%, and 26.8%, respectively (Table 5). These percentages can be attributed to the fact that the growth cycle of Korea's game industry spans the product development period to the maturity period, with major tasks performed in each cycle.

Table 5. Major activities by game companies

Activity	Count	Percentage
Planning	90	26.8
Development	127	37.8
Distribution and Service Offerings	87	25.9
Marketing	23	6.8
Management	9	2.7
Total	336	100.0

2) Major platforms of game companies

The main platform for Korea's game companies is online, accounting for 128 out of 336 companies (38.1%), followed by PC games (80 of 336, or 23.7%) (Table 6). Other respondents did not have one clear platform, but are engaged in the game industry for the dispatch of human resources, as development agencies, and as distribution companies. The recent growth of online and mobile games has led to an increase in R&D for many game companies.

Table 6. Game Company Platforms

Platform	Count	Percentage
Arcades	24	7.2
PCs	80	23.7
Online	128	38.1
Video	7	2.1
Mobile Devices	66	19.6
Other	31	9.3
Total	336	100.0

3) Number of employees

Regarding the number of employees, 153 companies (45.6%) had between 11 and 50 employees, followed by 93 (27.8%) with fewer than 10 (Table 7). Most of the game companies operate as small and medium-sized companies and venture companies, resulting in a shortage of professionals in areas such as R&D and marketing. These results indicate the need for government policies and for fostering professional workers who can work in the gaming industry.

4) Import and export values over three years

Looking at the average annual import and export values over the previous three years, 234 companies (69.6%) earned under US$1 million, revealing the small scale of operations for many game companies (Table 8). However, in interviews with the people in charge, the reason given for trade volumes slowly increasing every year was that they are interested in overseas markets. Moreover, despite a lack of information on overseas

sites and poor marketing capabilities, competitiveness in IT-based technologies is potentially playing a role in enhancing the competitiveness of games by Korean companies in overseas markets.

Table 7. Company Employees

Range	Number of Employees	Percentage
Under 10	93	27.8
11 to 50	153	45.6
51 to 100	38	11.4
101 to 300	26	7.6
More than 300	26	7.6
Total	336	100.0

Table 8. Average Annual Import and Export Values over Three Years

Value (US$)	Number of Companies	Percentage
Under 500,000	119	35.4
510,000 to 1,010,000	115	34.2
1,010,000 to 2,500,000	64	19
2,510,000 to 5,000,000	8	2.5
5,010,000 to 10,000,000	17	5.1
More than 10,010,000	13	3.8
Total	336	100.0

5) Major export areas

China and Southeast Asia were the major export destinations for 80 companies (23.7%) and 58 companies (17.3%), respectively. Other export markets include South America and Central Asia (Table 9).

Table 9. Major Export Area

Export Destination	Count	Percentage
America	46	13.6
EU	43	12.7
Japan	49	14.5
China	80	23.7
Southeast Asia	58	17.3
Middle East, Africa	15	4.6
Other	46	13.6
Total	336	100.0

4.2. Validity and Reliability Analysis

In this study, the reliability of variables constituting each factor was tested using Cronbach's alpha, the most common method for reliability analysis. Analysis results

exceeded the threshold of 0.7 or higher (Table 10). In general, questionnaire analysis acknowledges that a confidence coefficient of 0.70 or higher is relatively high.

Table 10. Reliability Coefficients of Variables

Variable	Measurement	Start	Erase	Use	Cronbach's Alpha
Manager	Executive experience and capability	6	3	3	.773
	Management attitude				
Technology	Innovation in technology	6	3	3	.876
	Technical mimicry potential				
	R&D personnel				
Market	Degree of market competition	10	7	3	.708
	Institutional protection				
	Game recognition				
Industry	Economic level	10	7	3	.729
	GDP				
	Game Industry Growth				
	Product Life Cycle				
	Network				
Adaptation	Marketing	6	3	3	.928
	Service				
	Platform				
R&D	R&D	5	3	2	.829
	Human Resources				
Performance	Profit Amount	3	0	3	.856
	Sales Profit				
	Export Profit				

Table 11. Factor Analysis

Measured Items		Components			
		Manager	Techno-logy	Market	Industry
X1	Management's ability to develop products and services	.817			
X2	Cognition of products and services by managers	.814			
X3	Professional competence of a manager	.758			
X7	High cooperation with relevant departments		.785		
X8	Standardized products of technological superiority		.774		
X9	Main axis of products with high differentiation		.605		
X15	Overseas market larger than domestic market			.761	
X18	Help from government-related research institutes			.881	
X20	Timely product supply			.729	
X25	Growth of the game industry				.843
X26	The higher the GDP, the higher the adaptation				.799
X27	The higher the GDP, the higher the R&D				.706
Characteristic		22.644	5.287	5.865	9.444
Total sample dispersion ratio		9.921	7.104	7.609	9.618
Cronbach's alpha		.773	.876	.708	.729
KMO		.713			
Bartlett's test		Chi-Square=1246.946, df=496			
Significance probability		.000			

** Value of the variable with the largest amount of factor load, significance level =0.05

Table 12. Correlation by Factor

Classify	A	B	C	D	E	F	G
Manager (A)	1						
Technology (B)	.105(**)	1					
Market (C)	.392	.006(*)	1				
Industry (D)	.068(*)	.541	.462	1			
Adaptation (E)	.008(**)	.006(**)	.036(**)	.545	1		
R&D (F)	-0.732	.054(*)	.598	.002(**)	.635	1	
Performance (G)	.196	.050(*)	.004(**)	.694	.013(**)	.005(*)	1
**(Significance at the 0.01 level), *(Significance at the 0.05 level)							

Unnecessary factors were eliminated, and factors were extracted through factor analysis. Eigenvalues of 1.000 or less were excluded. In exploratory factor analysis, the principal component method was used, and factor rotation ensured interdependence between the factors using the varimax orthogonal rotation method. The factor analysis results showed that the Kaiser-Mayer-Olkin (KMO) measure of sample adequacy (MSA) was 0.713 > α=0.5; chi-square in Bartlett's test was 1246.946, and the significance probability was 0.000 < <=0.05. The cumulative distribution of the four factors accounted for 43.24% of the total data (Table 11).

Correlation analysis between variables provides an overview of the relationships between variables introduced in the study, and predicts the results from verification of an established hypothesis. Correlation values are used to interpret the analysis, and it is common to assume the following: 1.0 to 0.7 (very relevant), 0.7 to 0.4 (significant), 0.4 to 0.2 (slightly relevant), and 0.2 to 0.0 (irrelevant). Correlation analysis results are shown in Table 12.

Conformity assessment of the study model is a procedure to examine how well the covariance structural model fits the hypotheses in the study (Table 13).

Table 13. Conformity Assessment Index

Classification	Model Conformity Assessment Index		Result
Absolute Conformity Index	χ^2	Chi-square (degree of freedom)	44.462 (39df)
	P	Significance probability	*.101 ≥ .05*
	Q	Chi-squared/degree-of-freedom ratio ≤ 3	1.01 3
	GFI	Goodness of Fit Index ≥ 0.9	.942 ≥ .9
	AGFI	Adjusted GFI ≥ 0.9	.793 ≤ .9
	RMR	Root Mean Square Residual	.029 ≤ .05
	RMSEA	Root Mean Square Error of Approximation	.04 ≤ .05
Incremental Conformity Index	NFI	Normed Fit Index ≥ 0.9	.992 ≥ .9
	RFI	Relative Fit Index ≥ 0.9	.805 ≤ .9
	CFI	Comparative Fit Index ≥ 0.9	.952 ≥ .9
Simplicity Conformity Index	PNFI	Parsimonious Normed-of-Fit Index	.593

4.3. Route Analysis Results

In this study, the results of structural equation modeling used to test the hypotheses are shown in Table 14.

First, the hypothesis that manager factors have a positive effect on market adaptation was supported, but an effect on R&D was not. According to this study, manager confidence in the company is a significant factor in both information technology and relationships [1, 52, 53]. However, this study found that market adaptation linked to relationships was supported, but manager factors did not show any effect on R&D [63,72].

Second, the hypotheses that technology factors have a positive effect on market adaptation and R&D were supported. This is consistent with prior studies [21, 37, 41]. In other words, a well-equipped entity achieves effective performance, and enhances performance through market adaptation and R&D. Therefore, in the game industry, it is very important to enhance the technical competence of the enterprises.

Third, the hypothesis that market factors have a positive effect on market adaptation was supported. This is consistent with a study that showed changes in market demand require rapid responses [63, 12, 72]. However, the hypothesis that market factors have a positive effect on R&D was not supported. This hypothesis did not match prior studies, which is believed to be due to negative factors such as technology imitation in the game industry, or unauthorized use of patents [49, 60].

Fourth, the hypothesis that industrial factors have a positive effect on market adaptation was not supported. This hypothesis is not consistent with prior studies [9, 28, 73] and perhaps it is because it is difficult to drive the flow of the market for companies that have items that are pioneering new markets. However, the hypothesis about them having a positive effect on R&D was supported [12, 64, 69].

Fifth, the hypothesis that market adaptation factors have a positive effect on corporate performance was established as consistent with prior studies [5, 26, 27, 29]. Also, the hypothesis that R&D factors have a positive impact on corporate performance was supported [33, 36]. Therefore, to enhance corporate performance, it is necessary to continuously strengthen R&D and adapt to markets. The route analysis results are as shown in Table 14.

Table 14. Route Analysis Results

Hypothesis	Path	Path coefficient	Standard error	t	p	Result
H 1-1	Manager→Adaptation	.231	.238	1.942	.001**	Accepted
H 1-2	Manager→R&D	-.257	.241	-2.008	.118	Rejected
H 2-1	Technology→Adaptation	.289	.148	.902	.009*	Accepted
H 2-2	Technology→R&D	.651	.232	2.721	.007*	Accepted
H 3-1	Market→Adaptation	.245	.431	2.541	.002	Accepted
H 3-2	Market→R&D	-.191	.435	-.491	.515	Rejected
H 4-1	Industry→Adaptation	.101	.145	.254	.581	Rejected
H 4-2	Industry→R&D	.513	.269	3.375	.003*	Accepted
H 5-1	Adaptation→Performance	.393	.171	2.571	.001**	Accepted
H 5-2	R&D→Performance	.338	.145	2.581	.001**	Accepted

**Significance at the 0.01 level, *Significance at the 0.05 level

5. Implications

This study looked at Korea's game companies to determine factors that affect a firm's performance in the game industry. To that end, internal and external factors of the enterprises were identified, and empirical analysis was performed using market adaptation and R&D capabilities as parameters. The analysis results are as follows.

First, the experience of corporate managers, their management know-how, and attitudes toward the introduction of external technologies showed significant impacts on R&D. In addition, in the game industry, where creative perspectives and timing are important, the subjective will of managers is an obstacle to R&D and market adaptation.

Second, a company's discriminatory technology capabilities showed significant effects on sustained R&D and market adaptation. However, imitation by latecomers and the lack of corporate size and technical expertise were shown to be obstacles to R&D and market adaptation.

Third, product awareness and time of release onto the market have a significant impact on market adaptation, but were shown to be a barrier to R&D. This is because the game market attracts consumer choices through marketing, rather than technology and creative approaches.

Fourth, the nature of the game industry has a significant impact on R&D, but not on market adaptation. This means that technology changes are required to meet environmental characteristics such as consumer demand and game environment infrastructure, but such characteristics are somewhat too much to lead market changes.

Fifth, R&D and market adaptation by enterprises have a significant impact on performance. This shows that companies improve corporate profits and secure market stability by strengthening product competitiveness through R&D and from consumer marketing through market adaptation.

At the same time, a negative perception about copying technology has emerged in the game industry. To solve this problem, strengthening intellectual property rights to prevent the theft or copying of creative ideas, plus indirect support through intergovernmental negotiations, is required when exporting to underdeveloped countries.

R&D and property rights management vary depending on the size of the enterprise. Based on the results of this research, the following measures are proposed to maintain the competitiveness of game companies.

First, steady support for R&D is needed to enhance corporate performance. R&D should be handled as a corporate policy, not as changes in R&D budgets and support only at the discretion of managers. In other words, securing R&D competitiveness should be prioritized in budgeting and policy decisions.

Second, in order to maintain and develop technology, qualitative management through the recruitment of professionals and performance-linked incentives are required. If the company is large, it is necessary to set up and operate a dedicated department. However, if an entity is small, it is necessary to establish inter-enterprise cooperation or clusters.

Third, developmental imitation, not simple imitation, can reduce R&D costs. It is necessary to identify ongoing technology and market trends, and to strengthen mutual cooperation through cross-licensing if necessary.

Fourth, it is necessary to utilize R&D capabilities in companies as a key strategic objective. Marketing should be carried out in a technology-driven market, and policies

should be formulated to protect property rights in cooperation with government. If necessary, market dominance should be secured through M&A and clusters.

Finally, it is necessary to seek market access and expansion to meet the life cycle of the game industry. Each country has a different game environment and infrastructure, so there is no need to pursue fast R&D. Stable management performance and enhancement of enterprises can be secured in various markets.

With online growth and technological advances, the game industry is globalizing. Games are no longer a mere tool of amusement but a tool of learning. For development in the game industry, it is necessary to consider transformation of developer awareness, standardization of technology, and development of links with other industries. The game industry can be a new growth engine driving a country's economic growth.

6. Conclusion

The game industry is becoming a new growth engine in the Industry 4.0 paradigm. In other words, the game industry requires continuous management and investment, including identifying market trends, R&D, and monitoring of foreign technologies. This study explored success factors that can enhance market performance among Korea's game companies. The implications of the empirical analysis are as follows.

First, managers should strengthen their capabilities and pursue cooperation with other companies. The game industry requires collaboration to enhance performance in technology development, marketing, and services. Administrators need to invest more in ongoing collaborative networks to reflect the nature of the enterprise and achieve its goals.

Second, R&D sharing through clustering is required because it differentiates technology according to the size of the game company. It is necessary to build a cluster that can have a significant impact on market performance, such as the retention of professionals and capital liquidity.

Third, since marketing is deeply related to customer service, it needs to be sensitive to changes in the game market environment. In addition, adequate market adaptation is necessary for new game environments such as video, arcades, PCs, and mobile devices. Consequently, it can lead to the release and distribution of games and to the expansion of game-related items, thereby enhancing corporate performance.

Fourth, it is necessary to grow gaming into a strategic industry through government support and policy development. The game industry can be fostered through policies such as R&D support, funding for the distribution of games, and by protecting property and patent rights.

Consequently, the gaming industry is emerging as a central sector in the Industry 4.0 paradigm, necessitating sustained management, investment, and vigilance towards global technological trends. This research delineated pivotal success factors for enhancing market performance among Korean gaming corporations. Noteworthy findings advocate for managers to augment their competencies and seek collaboration with external entities, underscoring the significance of R&D sharing and clustering contingent upon the firm's size. Additionally, adaptability to market shifts across diverse gaming

platforms is imperative. Ultimately, governmental support and policy initiatives are crucial for the strategic advancement of the industry.

However, this study did not deal with administrative procedures such as obtaining intellectual property rights or protecting patent rights. Also, analysis of individual items in terms of the effects of R&D investment and consumer awareness was insufficient. Besides, the number of game companies in the sample is relatively small, making it less valid to generalize these research findings. Therefore, in follow-up studies, we want to supplement the humanities approach that companies and consumers create together, rather taking than a technical approach, and intend to increase the number of sample companies to conduct in-depth industry-specific research on game companies and games. In addition, a comparative study of R&D and intellectual property management strategies in the game industry is necessary.

References

1. Abdullah, M. F., Khan, N. R. M., & Ibrahim, M. A.: Exploring the Influence of SERVQUAL Dimensions of Reliability, Responsiveness and Assurance towards Consumers Loyalty: The Mediating Effect of Commitment-Trust Relationship Marketing Theory. International Journal of Academic Research in Business and Social Sciences, Vol. 12,No. 11, 1580 -1591. (2022)
2. Akcay, D. D. S.: Causality Relationship between Total R&D Investment and Economic Growth. The Journal of Faculty of Economics and Administrative Sciences, Vol. 16, No. 1, 79-92. (2011)
3. Anderson, C., Narus, A.: A model of distributor firm and manufacturer firm working partnerships. Journal of Marketing, Vol. 54, No. 1, 48-58. (1990)
4. Ayaz Ahmed, Jia Li: Effect of In-App Purchases on Consumer Purchasing Behavior in Mobile Games. Journal of Business Research, Vol. 117, No. 9, 222-235. (2020)
5. Baek Yeong-ki: Competiton, Collaboration and Innovation Networks in Regional Economic Development: the Case of Chonbuk. Journal of the Economic Geographical Society of Korea, Vol. 9, No. 3, 459-472. (2006)
6. Barney, J. B.: Firm Resources and Sustained Competitive Advantage. Journal of management, Vol. 17, No. 1, (1991)
7. Bravo-Ortega, Claudio and A.G. Marin: R&D and Productivity: A Two Way Avenue?. World Development, Vol. 39, No. 7, 1090-1107. (2011)
8. Caillaud, Bernard, Jullien, Bruno: Chicken and Egg Competition among intermediation service providers. Rand Journal of Economics. Vol. 34, No. 2, 309-328. (2003)
9. Camargo P., Piggin J., Mezzadri F.: The politics of sport funding in Brazil: a multiple streams analysis. International Journal of Sport Policy and Politics, Vol. 12, No.4, 599-615. (2020)
10. Chang, C. H., Lee, K. H., Noh, K. S.: A Study on Comparative Analysis for Competitiveness of Success Factors of the Platform Business. Journal of Digital Convergence, Vol. 14, No. 3, 243-250. (2016.)
11. Choi Jinah, Kim Dongweon: Global Marketing Strategies of Online Game Companies: The Case of Korean Companies' Localization in Japan. International Business Reviews, Vol. 15, No. 3, 175-200. (2011)
12. Choi Sung: A Study of IT competitiveness of SMEs by Cloud Services. Journal of Digital Convergence, Vol. 11, No. 3, 59-71. (2013)

13. Choi, Byong-Sam, Kim Joo Han: A Study of the Effect of the General Definition of Platforms on the Firm's Economic and Strategy Decision-Making. The Journal of Business Education, Vol. 25, No. 3, 157-176. (2011)
14. Cockburn, I., and Griliches, Z.: Industry Effects and Appropriability Measures in the Stock Market's Valuation of R&D and Patents. The American Economic Review, Vol. 78, No. 2, 419-423, (1988)
15. Covin, J. G., & Slevin, D. P.: A Conceptual Mode of entrepreneurship as Firm Behavior. Entrepreneurship theory and Practice, Vol. 16, No. 1, 7-26. (1991)
16. Daradkeh, M.: Exploring the Boundaries of Success: A Literature Review and Research Agenda on Resource, Complementary, and Ecological Boundaries in Digital Platform Business Model Innovation. Informatics, Vol. 10, No. 2, 1-30. (2023)
17. Freighthub, Available online: https://freighthub.com/en/ (accessed on 17 June 2019).
18. Freightos, Available online: https://www.freightos.com/ (accessed on 16 June 2019).
19. Griliches, Z. and F. Lichtenberg: Interindustry Technology Flows and Productivity Growth: A Re-examination. The Review of Economics and Statistics, Vol. 66, No. 2, 324-29. (1984)
20. Griliches, Z.: Productivity, R&D, and Basic Research at the Firm Level in the 1970s. American Economic Review, Vol. 76, No. 1, 141-154. (1986)
21. Griliches, Z.: The Discovery of the Residual: A Historical Note. Journal of the Economic Literature, Vol. 34, No. 3, 1324-1330. (1996)
22. Guichard, L., Stepanok, I.: International Trade, Intellectual Property Rights and the (Un)employment of Migrants. The World Economy, Vol. 46, No. 7, 1940-1966. (2023)
23. Hambrick, D. C. and Phylls , Manson: Upper Echelons: The Organization as a Reflection of Its Top Managers. Academy of Management Review, Vol. 9, No. 2, 193-206. (1984)
24. Hyunseung Jung, Kiyoon Kim, Daiwon Hyun: Analysis of Priorities of Policy Implementation Tasks for Revitalizing Virtual Reality(VR) and Augmented Reality(AR) Industries. JOURNAL OF THE KOREA CONTENTS ASSOCIATION, Vol. 21, No. 9, 12-23. (2021)
25. Jin, Dongsu: Exploratory Research on Success & Failure of Platform business. International Commerce and Information Review, Vol. 15, No. 2, 387-410. (2013)
26. Joo, Hyun Woo: A Study on the Strategic Development Model of the Logistics Platform. Master's Thesis, Chung-Ang University, Seoul, (2018)
27. Kim Changwook, Lee Sangkyu: Fragmented industrial structure and fragmented resistance in Korea's digital game industry. Television & New Media, Vol. 5, No. 4, 354-371. (2020)
28. Kim, J.: Meta-verse platforms and content business trends in domestic and international markets. KOREA COMMUNICATIONS AGENCY, Media Issue & Trend, Vol. 45, 32-42. (2021)
29. Kim Mi-na: A Study on the institutional delay and the path dependent change of the game industrial policy in korea. The Korea Association for Policy Studies, Vol. 12, No. 3, 143-170. (2003)
30. Kim Min Kyu: Reflection and Suggestions on the Effects of Game Culture Policy. Journal of Korea Game Society, Vol. 18, No. 6, 95-110. (2018)
31. Kim Sun-nam, Kang Kyong Sik: Empirical study on the acceptance intention of online service platform - Focused on international logistics. Journal of Korea Safety Management & Science, Vol. 18, No. 2, 101-107. (2016)
32. Kim Sun-Nam: An Empirical Study on the Important Factors Increasing the Acceptance Intention of Online International Logistics Platform. Doctoral Dissertation, Myongji University, Seoul, (2016)
33. Kim Yeon Jeong: The Inter Industrial Competency Analysis of Game Industry and Character Industry. Journal of Korea Technology Innovation Society, Vol. 16, No. 4, 1187-1204. (2013)

34. Kim Yunkyung: A Study on the Current Status and Forecast on Chinese Game in Relation to Game Platform-Focus on SNG. Journal of Korea Game Society, Vol. 10, No. 2, 81-88. (2010)
35. Kim, Mie-Jung and Thunt, Htut-Oo: An Analysis of Export Competitiveness in Myanmar: Measuring Revealed Comparative Advantage. Journal of International Trade & Commerce, Vol. 13, No. 2, 149-172. (2017)
36. Kim, Sung-Chul: Bilateral Trade Intensity Analysis and Implications on Korean Computer Industry in U.S. Market. Journal of Industrial Economics and Business, Vol. 28, No. 5, 2087-2104. (2015)
37. Koo Hoon Young: The Role of Cooperative R&D and Intangible Assets in Innovation and Corporate Performance of R&D Investment in Manufacturing Sectors. Journal of Society of Korea Industrial and Systems Engineering, Vol. 43, No. 1, 79-86. (2020)
38. Korea Creative content Agency, WHITE PAPER ON KOREAN GAMES 2019, (2019)
39. Kyoung-Mi Lee, Hoon Huh: An Empirical Study on the Entry of the Korean Game Industry into Emerging Markets and Strategy - Focusing on the Gravity Model –. Journal of the Korea Entertainment Industry Association, Vol. 16, No. 8, 165-175. (2022)
40. Lee Jongho, Kim Tae Hwan, Jung Woo-jin: R&D Investment Effect through Patent on IT firms using Panel Structural Equations. Knowledge Management Research, Vol. 21, No. 1, 137-150. (2020)
41. Lee Seung-Hee, "Nori" Culture in the Age of the Fourth Industrial Revolution ― Focusing on Korea-China Game Industry, The Association Of Chinese Language, Literature And Translation In Korea, Vol. 41, 217-239, (2017)
42. Legris, P., Ingham, J., Collerette, P.: Why do people use information technology? A critical review of the technology acceptance model. Information & Management, Vol. 40, No. 3, 191-204. (2003)
43. Lim Jun-Hyeong: Export Competitiveness among Korea, China and Japan in the Electronic Integrated Circuits Industry under the HS. Journal of Korea Research Society for Customs, Vol. 12, No. 3, 133-149. (2011)
44. Lim Jun-Hyung: Competitiveness Comparison between Korea and China in the Household Electronic Appliances Industry. Journal of Industrial Economics and Business, Vol. 22, No. 2, 905-918. (2009)
45. Liu Yu, Kwon Sang Jib: Entertainment Contents Corporation Tencent's Growth Strategy : Focusing on Imitative Innovation and M&A. Journal of Korea Entertainment Industry Association, Vol. 14, No. 3, 1-13. (2020)
46. Mamuneas, T. P.: Spillovers from Publicly Financed R&D Capital in High-Tech Industries. International Journal of Industrial Organization, Vol. 17, No. 2, 215-239. (1999)
47. Mansfield, Edwin: Basic Research and Productivity Increase in Manufacturing. American Economic review, Vol. 70, No. 5, 863-873. (1980)
48. Maskus, K. E., & M. Penubarti, "How Trade -related Are Intellectual Property Rights?", Journal of International Economics, (1995)
49. Maskus, Keith E. & Guifang Yang: Intellectual Property Rights, Foreign Direct Investment, and Competition Issues in Developing Countries. International Journal of Technology Management, Vol. 19, 1-18. (1999)
50. Mayer, Roger C., Davis, James H., Schoorman, F. David.: An Integrative Model of Organizational Trust. The Academy of Management Review, Vol. 20, No. 3, 709-734, (1995)
51. Mitja Ruzzier, E. Douglas, Maja Konečnik Ruzzier, Jana Hojnik: International Entrepreneurial Orientation and the Intention to Internationalize. Sustainability, Vol. 12, No. 14, 1-20. (2020)
52. Morgan, R.M. and Hunt, S.D.: The commitment-trust theory of relationship marketing. Journal of Marketing, Vol. 58, No. 3, 20–38. (1994)

53. O'Connor, P.: User-generated content and travel: A case study on tripadvisor.com. Inf. Commun. Technol. Tour., 47-58. (2008)
54. Oh, Sun Jung, Kim, Taeyoung: Analyzing the employment impact of the Korean Wave support policies using the Contingent Valuation Method. Journal of Korea Culture Industry, Vol. 21, No. 1, 51-59. (2021)
55. Park Jong-Sam: A Study on the K Contents Industry.Journal of Korea Culture Industry. Vol. 21, No. 3, 193-200. (2021)
56. Pankaj M. Madhani: Deploying a "Good Jobs" Strategy in Service Sectors for Enhancing Competitive Advantage. International Journal of Business Strategy and Automation, Vol. 2, No. 1, 29-53. (2021)
57. Petri Kettunen, Janne Järvinen, Tommi Mikkonen, Tomi Männistö: Energizing collaborative industry-academia learning: a present case and future visions. European Journal of Futures Research, Vol. 10, No. 8, 1-16. (2022)
58. Pfeffer, J.: Competite Advantage through People, Boston. Harvard Business School Press, (1994)
59. Pontiggia A., Virili, F.: Network effects in technology acceptance: laboratory experimental evidence. International Journal of Information Management, Vol. 30, No. 1, 68-77. (2010)
60. Quan Dong, Juan Carlos Bárcena-Ruiz, María Begoña Garzón: Intellectual property rights and North-South trade: Exports vs. foreign direct investment. Estudios de Economía, Vol. 49, No. 2, 145-160. (2022)
61. Rapp, Richard T., Richard P. Rozek: Benefits and Costs of Intellectual Property Protection in Developing Countries. Journal of World Trade Vol. 24, No. 5, 75-102. (1990)
62. Rosenberg, Larry J., Czepiel, John A.: A marketing approach for customer retention. Journal of Consumer Marketing, Vol. 1, No. 2, 45-51, (1984)
63. Shin Kwangyong, Zhongtian Shen, Haekun Shin, Shiyao Zhang, Ke Chen, & Lijie Li: The Mechanism of How Integrated Marketing Communications Influence on the Chinese Online Customer's Repurchase Intention. Science Journal of Business and Management, Vol. 9, No. 1, 26-38. (2021)
64. Shim Sang-min, Content Industry - New Trends in Content Business and Response Strategies. Digital Contents, Vol. 113, 114-121. (2002)
65. Smith, B., Barclay, W.: The effects of organizational differences and trust on the effectiveness of selling partner relationships. The Journal of Marketing, Vol. 61, No. 1, 3-21. (1997)
66. Snow, C. C., L. G. Hrebiniak: Measuring Oraganizational Strategies, & Organizational Performance. Administrative Science Quarterly Vol. 25, No. 2, (1980)
67. Sorce J, Issa, R.: Extended Technology Acceptance Model (TAM) for adoption of Information and Communications Technology (ICT) in the US Construction Industry. ITcon, Vol. 26, 227-248. (2021)
68. Sung-Wone Choi, Sung-Mok Lee, Joong-Eon Koh, Hyun-Ji Kim, Jeong-Soo Kim,: A Study on the elements of business model innovation of non-fungible token blockchain game : based on 'PlayDapp' case, an in-game digital asset distribution platform. Journal of Korea Game Society, Vol. 21, No. 2, 123-137. (2021)
69. Tamzil, F., Anwar, N., & Hadi, M. A.: Security Utilization of Cloud Computing in The World of Business For Small Medium Enterprises (SMEs). International Journal of Science, Technology & Management, Vol. 3, No. 1, 41-49. (2022)
70. Venkatesh, Viswanath, Morris, Michael G., Davis, Gordon B., Davis, Fred D.: User Acceptance of Information Technology: Toward a Unified View. MIS Quarterly, Vol. 27, No. 3, 425-478, (2003)
71. Vishal Goyal: The COVID-19 Pandemic and Digital Gaming: A Boon or a Bane?. International Journal of Advanced Research in Computer Science and Software Engineering, Vol. 10, No. 10, 286-290. (2020)

72. Wen, C., Prybutok, V.R. and Xu, C.: An integrated model for customer online repurchase intention. J. Comput. Inf. Syst. Vol. 52, No.1, 14–23. (2011)
73. Yoo Sang-Keon, Kim Yong-Eun, Won-Jae Seo: Sports Celebrities as a Determinant of Sport Media Distribution Contents: Focusing on Tacit Premise of Agenda Setting Theory. Journal of Distribution Science, Vol. 17, No. 10, 83-91. (2019)
74. Yang Q, Hayat N, Al Mamun A, Makhbul ZKM, Zainol NR: Sustainable customer retention through social media marketing activities using hybrid SEM-neural network approach. PLoS ONE, Vol. 17, No. 3, 1-23. (2022)
75. Zheng Qiumei, Li Chenglong, Bai Shizhen: Evaluating the couriers' experiences of logistics platform: The extension of expectation confirmation model and technology acceptance model. Frontiers in Psychology, Vol. 13, 1-20. (2022)

Jun-Ho Lee works at a Faculty of Division of Public Affairs and Police Administration at Dongguk University- WISE. He received his Ph. D. in Public Management from Renmin University of China. His current research interests include: Industrial Clusters, Strategic Alliances between Companies.

Jae-Kyu Lee is a Researcher of the Smart Contents Institute at Dongguk University-WISE. He received his Ph. D. in Engineering, specializing in Information Technology from Dongguk University-WISE in 2024. His research interests include: Virtual Reality, Artificial Intelligence, Educational Technology, Realistic Media, and IT Convergence Software.

Seung-Gyun Yoo (Correspondence*) works at a Faculty of Department of International Trade and Airline Service at Dongguk University-WISE. He has worked on the editorial board of the journal of the Korea Society for Customs from 2017 and the e-Business Studies from 2019. His research interests include: Global Marketing, IoT, FDI, Cross-cultural Management.

Received: November 17, 2022; Accepted: October 05, 2023.