

A Study on the Actual Conditions and Usage of Korean Design Right

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Abstract

Background/Objectives: The convergence of 4th industrial and design management, which is affecting large companies and small/medium companies in recent years, has become an important trend of Korean business management at present.

Methods/Statistical Analysis: In order to suggest the utilization measures suitable for the time flow by understanding the perception of the 4th industry and design right in the management of jewelry company and also applying it to Korean jewelry industry, the concept and significance of the 4th industry and design right were understood. Also, the current status of Korean jewelry industry and design right was researched. After conducting a survey on jewelry industry workers focusing on the set-up hypotheses, PLS 2.0 Program used for analysis.

Findings: In the results of basic statistical analysis, the percentage of men(56%) was higher than female(48%) out of total 160 people. The job currently working for in the jewelry industry and the job desired in the future were the design with the highest ratio, so that the importance of design was high in Korean jewelry industry. Also, design was the first priority of management mind, important elements of jewelry industry management, and successful management strategy while technology showed a bit less importance than factors of marketing, capital, and personal connections. In the results of analyzing the reliability and validity of the set-up hypotheses by using PLS, they were suitable in the verification of internal consistency, convergent validity, and discriminant validity. In the results of verifying the path coefficient and its significance, all the five hypotheses suggested by the researcher were significant and selected. Especially, the management mind had the biggest effect on the management will. Even though the awareness of design right was high, the awareness and utilization of the 4th industrial technology were very low.

Improvements/Applications: Promote the development of jewelry industry suitable, it would be required to have the convergent management thinking for active introduction of the 3D print and the management of design right.

Key Words : Design Copyright, Design Management, Management Commitment, Management Mind, Analysis, PLS.

1 Introduction

We already live in the 4th industrial. The gradual development and evolution of high-tech devices make our lives abundant. The 4th industrial started from manufacturing companies. Especially, manufacturing businesses actively reflected the advanced technology of the 4th industrial to the management, which is directly connected to profits. The advancement of corporate management is very important as the first step to achieve the profit and development. Such important management has its own flow. The convergence of the 4th industrial starting from large companies and having gradual

effects on small/medium companies, corporate image, and design management expanding to the overall management has become an important trend of management in Korea.

The advanced technology of the 4th industrial is evolving into a management trend in the overall industry of Korea, together with the design management aiming to protect/form the individuality of companies. Especially, after the patent litigation between Apple and Samsung, the intellectual property right is rising as a new power of companies.

Therefore, the jewelry industry of Korea would need the management strategic measures to adapt to the management change of other industries. Especially, in the jewelry industry, the manufacturing technology and design are directly connected to profits and corporate competitiveness, so that it would be necessary to strengthen the perception of design right suitable for the 4th industrial revolution era.

However, the jewelry industry of Korea is closed and poor compared to other manufacturing industries. This management method only accelerates the stagnation of jewelry industry. Thus, the researcher aims to study the measures to use the design right for the corporate competitiveness in order to solve the stagnation of Korean jewelry industry and the advanced technology of the 4th industrial, and also to grow into the high value-added industry. In other words, on top of improving the perception of design right of jewelry industry workers and students, this study aims to suggest the measures to use the jewelry design right suitable for the 4th industry.

In the management method of Korean jewelry industry, it aims to perform methods as follows to utilize the design right and technology of the 4th industrial revolution era. First, after understanding the outline and meaning of the 4th industrial revolution, the type and utilization scope of the 4th industry are understood. Second, the actual retention status of design right in Korean jewelry industry is comparatively researched focusing on two domestic/foreign representative businesses. Third, the actual status of perception of the 4th industry and design right is researched focusing on the current workers related to jewelry. The survey has 20 or less questions and the response is limited to five. Fourth, after analyzing the validity and reliability of the collected survey through

PLS Statistical Program, the measures for the utilization of jewelry design right and technology of the 4th industry are suggested.

2 Design Rights, Korea Jewelry Industry Status

2.1 Definition of Design Right

As a right of intangible property to protect humans' intellectual creation, it is largely classified into industrial property right and copyright. The industrial property right could be protected when it is registered after going through the screening by Patent Office, and the protection period is maintained for 10-20 years. As a right belonging to the industrial property right, the design right targets the physical design of goods by form, shape, and color. Contrary to the existing products, the appearance added by the aesthetic sense could be applied as design. The maintenance period of design right is 15 years from the registration date of design right[5].

As design is rising as a core competition area in the management of modern companies, good designs provide many advantages to companies, and products with distinctive individuality stand out from competitive products. It induces consumers to make correct selections and also helps them to easily use the products by instantly informing the value of them[6], so that the importance of design right is increasing.

2.2 Current Status of Korean Jewelry Industry

According to the business survey by the National Statistical Office, the number of jewelry businesses in the whole nation of 2017 was total 16,169, which was 1.1% decreased from the previous year. In each business type, the number of manufacturing businesses was 1,464, which was 7.6% increased from the previous year while the wholesale businesses(2,373) were similar to the previous year. On the other hand, the number of retail businesses was 11,333, which was 2.2% decreased from the previous year.

The size of domestic jewelry market in 2017 was 6,877.9billion won, which was 18.6% increased from the previous year. Ko-

rean jewelry market is divided into wedding present market and non-wedding present market. The wedding present market is estimated as 1,571.5billion won while the non-wedding present market is 5,306.4billion won. The wedding present market that has formed the relatively stable market was 2.2% decreased than the previous year while the non-wedding present market increased 28.3%, which led the increase of the whole market.

Instead of the direct growth of domestic market, however, it is the results of expanding the fashion jewelry market after the area of traditional materials(raw materials like gold & silver and jewel) faced the limitation, and the market also includes the import of complete jewelry and continuous sales increase of foreign brands. Considering the actual market economy and market size compared to the previous year, about 800-1,000billion won dominating 19-24% of non-wedding present market is estimated as this market[7].

2.3 Current Protection Status of Jewelry Design Right

After realizing the importance of design in the whole world, there have been lots of investment in the development. After realizing the importance of design in the whole world, there have been lots of investment in the development of technology and design. In case of Korea, due to the aftermath of IMF crisis in 1997, the design application/registration was decreased. After the recovery trend from 1998, the number of application has been continuously increasing since 1999[8]. Based on this, the corporate outline was understood through [Table 1] by selecting Tiffany & Co. as the most representative jewelry business of domestic market, and Golden Dew as a Korean family business-type company. [Table 2] is the current retention status of intellectual property right of Tiffany & Co.[9] and Golden Dew[10], and it shows that they only maintain the trademark application and design registration, instead of patent[11].

Table 1: Initial Set of features used for the experimentation

Brand Name	Tiffany & Co.	Golden Dew Co., Ltd
Brand Nationality	US	Korea
Founder	Charles Louis Tiffany, John Burnet Young	Lee, Geon Gap
Foundation Year	1837	1982
Total Sales	\$ 4,250,913,000 (5032.1 billion won)	10.80 billion won
No. of Full-Time Employee	1,250	210
No. of Offline Shop	295	85

(Basis of Korea in 2017)

Table 2: The Current Status of the Representative Jewelry Businesses' Possessing Intellectual Property Rights

Brand Name	Tiffany & Co.	Golden Dew Co., Ltd
Legal Protection	TM use, trademark rights	Design registration
Possessed Patents	None	None(5cases extinguished)
Others	Trademark application: 10cases Trademark registration: 130cases Trademark rejection: 13cases	Design registration: 106cases Design extinction: 157cases Design rejection: 68cases Design withdrawal: 2case Design abandonment: 3cases

(Basis of Korea in 2017)

3 Research Model and Hypothesis

3.1 Research Model

In order to suggest the developmental direction of design right of Korean jewelry industry suitable for the 4th industrial revolution era, this study aimed to verify if the awareness of the 4th industry and design right worked as management will. Understanding the outline of the 4th industrial revolution, design right, current status of Korean jewelry industry, and current protection status of design right through the theoretical background, it was realized that the awareness of the 4th industrial revolution and design right was very low.

Therefore, it was predicted that the awareness of the 4th industrial technology and design right would work positively on the management will. By understanding if there is a will to use the awareness of outline and classification of the 4th industrial revolution for manufacturing process, it also aims to understand the effects on the management will. The research model is [Figure 1].

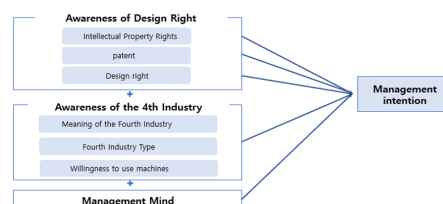


Figure 1: Research Model

The hypotheses set up based on measured variables are as follows.

Hypothesis1. The awareness of the 4th industrial revolution would have positive(+) effects on the management mind.

Hypothesis2. The awareness of the 4th industrial revolution would have positive(+) effects on the management will.

Hypothesis3. The awareness of design right would have positive(+) effects on the management mind.

Hypothesis4. The awareness of design right would have positive(+) effects on the management will.

Hypothesis5. The management mind would have positive(+) effects on the management will.

Based on this theory, the awareness of the 4th industry, awareness of design right, and management mind were selected as independent variables while the management will was selected as a dependent variable. The research model is like [Table 3].

Table 3: Measurement variable

Division	Measurement variable
Awareness of Design Right	Overall awareness of intellectual property right
Awareness of the 4th Industry	Awareness of concept and type of the 4th industry and the applicable areas in jewelry industry
Management Mind	Desire for introducing the 4th industry and will to overcome failures
Dependent Variable	Management will = Management intention

3.2 Composition of Questionnaire & Data Collection

For the objectification of effects of awareness of the 4th industry and design right on the management mind and management will in the jewelry industry, this study used a survey method targeting jewelry industry workers in their 20s-50s. The questionnaire was composed of total 24 questions including five questions about awareness of design right, five questions about awareness of the 4th industry, five questions about management mind showing the desire for introducing the 4th industry & will to overcome failures, five questions about management will, and four basic questions about sex, age, desired work, and interested area.

4 Analysis of Results

Owing to the characteristics of jewelry market, the management mind or management will was expected to be high when the awareness of the 4th industry and design right was high. Using the convenience sampling method as the non-probability sampling method in which members that could be easily obtained are selected by researchers, a survey was conducted targeting 200 male and female jewelry-related workers. After the preprocessing, total 160 subjects were extracted as samples for analysis.

4.1 Basic Statistics

In the results of basic statistics, the percentage of men(56%) out of 160 people was higher than the one of female(48%). Regarding the current and desired job of respondents, design was the highest, which showed the great interest in design.

Also, the elements emphasized for the management mind included design, marketing & technology, capital, and personal connections in order. The important elements of jewelry industry management perceived by respondents included design, technology, marketing, capital, and personal connections in order. The successful management strategies included design, capital, marketing, technology, and personal connections in order. In the results, design was the factor that has been emphasized or considered as the most important for the jewelry industry management. On the other hand, technology was not much important for the jewelry industry management.

4.2 Analysis of Reliability and Validity

Using Smart PLS 2.0 for the verification of research model, this study verified the internal consistency, convergent validity, and discriminant validity on the measuring questions and composition concept. For the verification of internal consistency, the composite reliability and reliability of awareness of the 4th industry, awareness of design right, management mind, and management intention were analyzed. The results of analysis are like [Table 4].

The composite reliability was 0.7 or up as the baseline argued

by Nunnally and Thompson et al. The Cronbach's α widely used for the verification of reliability was 0.7 or up. Thus, the internal consistency was suitable [12, 13].

The convergent consistency was verified through AVE (average variance extracted) and factor loading of composition concept. AVE was 0.5 or up as the baseline argued [14]. The factor loading of composition concept was 0.5 or up as the baseline [14]. The t-value of factor loading was all 1.96 or up.

Table 4: Internal consistency and Convergent validity Verification

Items	Loadings	t-value	AVE	Composite Reliability	Cronbachs' Alpha
Design Right 1	0.827	17.846	0.663	0.856	0.846
Design Right 2	0.854	30.447			
Design Right 3	0.771	29.264			
Design Right 4	0.728	40.313			
Design Right 5	0.757	14.656			
4th Industry 1	0.721	14.829	0.631	0.771	0.752
4th Industry 2	0.827	26.525			
4th Industry 3	0.732	16.011			
4th Industry 4	0.822	28.465			
4th Industry 5	0.726	23.901			
Management Mind 1	0.839	33.764	0.708	0.907	0.902
Management Mind 2	0.801	24.296			
Management Mind 3	0.865	32.419			
Management Mind 4	0.870	26.276			
Management Mind 5	0.842	39.541			
Management intention 1	0.845	38.917	0.709	0.908	0.904
Management intention 2	0.871	28.071			
Management intention 3	0.843	29.326			
Management intention 4	0.837	30.392			
Management intention 5	0.802	27.044			

The discriminant validity was verified by the matter of if the square root of AVE marking on the diagonal axis of correlation coefficients between composition concepts would be bigger than the correlation coefficients between other composition concepts [13]. In the results of analysis, it exceeded the biggest correlation coefficient (0.7944) out of square root (0.774) of AVE [Table 5], so that the discriminant validity was suitable [14].

As mentioned above, in the results of verifying the internal consistency, convergent validity, and discriminant validity of composition concept and measuring questions used for this research model,

all the standard requirements were met, which would be suitable for the structural model analysis.

Table 5: Discriminant validity Verification

	4th industry	design right	management mind	management intention
4th industry	0.794			
design right	0.434	0.814		
management mind	0.189	0.223	0.841	
management intention	0.774	0.411	0.436	0.842

4.3 Verification of Hypotheses

The results of PLS path analysis of this research model are like [Figure2] and [Table 6]. Through PLS analysis, the path coefficient and its significance were verified. Calculating the path coefficient of structural model by using the whole samples, the t-value of path coefficient was calculated by using the bootstrap of PLS [15]. In the results of analysis, all the five hypotheses suggested by this study were significant, and they were all selected.

Especially, Hypothesis5 showed the highest t-value out of other hypotheses, which means that the management mind has the biggest effects on the management intention compared to other variables.

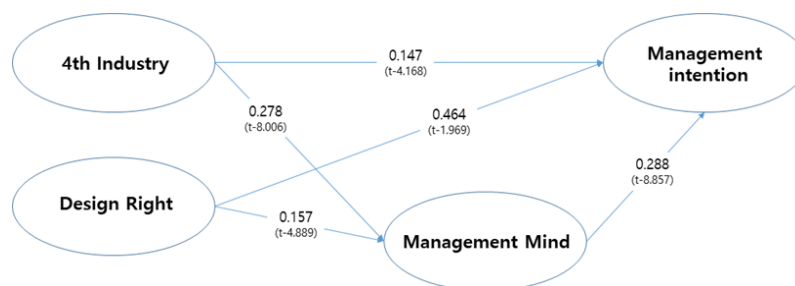


Figure 2: Research Model

Table 6: Hypothesis analysis result

Hypotheses	Route	Path coefficient	t-value	Result
Hypotheses 1	awareness of the 4th industry→ management mind	0.278	8.006***	Accepted
Hypotheses 2	awareness of the 4th industry → management intention	0.147	4.168***	Accepted
Hypotheses 3	awareness of design right → management mind	0.157	4.889***	Accepted
Hypotheses 4	awareness of design right → management intention	0.464	1.969***	Accepted
Hypotheses 5	management mind→ management intention	0.288	8.857***	Accepted

*p<0.05, ** p<0.01, *** p<0.001

5 Conclusion

This study aimed to suggest the measures to utilize the design right as a means of the 4th industrial technology and corporate management. The basis of jewelry industry is the manufacturing business, and currently, the utilization of the 4th industry is rare to be seen compared to other industries. Also, regarding the actual retention status of design right in Korean jewelry industry, foreign companies focused on trademark right while domestic companies focused on design right. The patent did not have great effects. Based on the theoretical background, this study set up a hypothesis that the awareness of the 4th industry and awareness of design right would have positive(+) effects on the management mind and management will in the jewelry industry management. To verify this, the awareness of the 4th industry, awareness of design right, and management mind were set up as independent variables while the management intention was set up as a dependent variable.

In the results of analysis by using PLS 2.0, all the awareness of the 4th industry, awareness of design right, and management mind had positive(+) effects on the management intention. Especially, the will to accept new technologies had huge effects on the management will. Also, in the results of researching the perception of the 4th industry and design right targeting current workers in the jewelry industry, overall, they were aware of intellectual property right and design right. However, the dependence and awareness of the 4th industrial technology were a bit low, which was not directly used for management. The current utilization of the 4th industrial technology in the jewelry industry is very low. Out of core technologies, 3D printing modeling could be mentioned as the technology

in the stage of utilization or test.

Therefore, for the continuous development of jewelry industry suitable for the time flow. it would be necessary to improve the perception for the active utilization of the 4th industrial technology for jewelry industry. In particular, efforts to combine more aggressive 3D printing technology, rational utilization of design right, there should be efforts to convergently protect technology and design right. Thus, through this study, there should be continuous researches and multilateral introduction of the 4th technology to form the higher value-added market for forming technology suitable for the time flow and sound design competition of jewelry industry by actively introducing the 4th industrial technology and reinforcing the convergent utilization of design right in Korean jewelry industry.

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