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THE EFFECTS OF KNOWLEDGE AND INNOVATION MANAGEMENT PROCESSES ON INNOVATION CAPABILITY AND NEW PRODUCT DEVELOPMENT SUCCESS [1]

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ABSTRACT

Knowledge management contributes to the performance of enterprises in developing goods and services, but also serves as a tool in the development of innovation capability and in the innovation process. The aim of this research is to examine whether knowledge and innovation management has an impact on the innovation capabilities of enterprises and on the success of new products. In line with this aim, 10 enterprises that constitute the majority of the domestic market in the Turkish white goods sector have formed the universe of the research. As a sampling method, judgemental sampling method was selected, and 600 white collar employees were included in the study. Data were analyzed using SPSS and AMOSS programs. As a result of the research, it has been concluded that innovation ability has a direct impact on new product success. Moreover, it has emerged that information creation, process innovation and capability innovation have directly affected innovation capability. On the other hand, inter-organizational information sharing and implementation and structural innovation have no effect on innovation capability.

Keywords: *Knowledge Management; Innovation Management; Innovation Capability; New Product Success*
JEL Codes: *D80, O30, 032, M31*

BİLGİ VE İNOVASYON YÖNETİM SÜRECİ BOYUTLARININ İNOVASYON YETENEĞİ VE YENİ ÜRÜN BAŞARISINA ETKİSİ

ÖZ

Bilgi yönetimi, işletmelerin mal ve hizmet geliştirme performansına katkı sağlamakla birlikte inovasyon yeteneğinin gelişmesinde ve inovasyon sürecinde aracı görevini üstlenmektedir. Bu araştırmanın amacı bilgi ve inovasyon yönetiminin işletmelerin inovasyon yeteneklerine ve yeni ürün başarısına etkileri olup olmadığının incelenmesidir. Bu amaç doğrultusunda, Türkiye beyaz eşya sektöründeki iç pazarın büyük çoğunluğunu oluşturan 10 işletme araştırmanın evrenini oluşturmuştur. Örnekleme yöntemi olarak da Yargısal Örnekleme Yöntemi seçilmiş ve araştırmaya 600 beyaz yakalı çalışan dâhil edilmiştir. Veriler SPSS ve AMOS programlarıyla analiz edilmiştir. Araştırma sonucunda, inovasyon yeteneğinin yeni ürün başarısına doğrudan etkisi olduğu, yine aynı şekilde bilgi yaratmanın, süreç inovasyonunun ve yetenek inovasyonunun inovasyon yeteneğini doğrudan etkilediği ortaya çıkmıştır. Buna karşılık örgüt içi bilgi paylaşımı ve uygulamanın ve yapısal inovasyonun inovasyon yeteneği üzerinde herhangi bir etkisi tespit edilmemiştir.

Keywords: *Bilgi Yönetimi; İnovasyon Yönetimi; İnovasyon Yeteneği; Yeni Ürün Başarısı*
Jel Kodları: *D80, O30, 032, M31*

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1. INTRODUCTION

Knowledge, which is the input of goods and services, has an important place in developing the innovation capability of enterprises and in developing products. Knowledge management is composed of activities such as providing knowledge, using and sharing this knowledge with the environment, and establishing systems to manage knowledge flow. Knowledge management takes on the role of intermediary in the development of innovation capability and innovation process and contributes to the performance of enterprises in the development of goods and services. That is, written or non-written knowledge for the development of goods, services and processes that will be beneficial to the enterprise plays an important role in finding the ideal idea of innovation and implementing this idea.

Knowledge and innovation management is a discipline that is increasingly understood and that is increasing in importance, with a long-term learning process, knowledge design and knowledge exchange. The enterprise's expertise in knowledge management and a market-oriented approach are crucial to the acceptance of innovation, the transformation of innovation activities into value and the development of new products.

This study primarily examines how enterprises in the white goods sector approach knowledge and innovation management in Turkey and analyzes the links between this approach and the innovation capabilities of enterprises and the success of new products.

2. LITERATURE REVIEW

Knowledge management is maybe the most important issue for enterprises (Dimitrios et al., 2018). A definition that summarizes the knowledge management process is made by Alavi and Leidner. The knowledge management process in this definition operates in the following way: Firstly, the knowledge in employees' minds is recorded in different ways. Later, depending on the organizational activities new knowledge is generated by collecting, organizing, storing and sharing knowledge resources that are produced in the organization or provided from outside the organization, stored in the electronic media or in the minds of the employees and then this knowledge is used in organizational activities (Alavi and Leidner, 2001). The basic element and first step of the knowledge management process is to obtain knowledge. The second step is to create knowledge, the third step is to share and apply knowledge in the organization where the knowledge needed for the organization is identified. The fourth and final step is knowledge storage and documentation. This process provides continuous feedback (Andreeva and Kianto, 2011). In short, information management is a management discipline that covers the collection, processing, sharing, use and measurement of

all internal and external information potential in a collective and systematic manner in order to achieve organizational objectives (Yanık, 2018).

The transformation of knowledge into economic and social benefits is defined as innovation (Tandoğan, 2018). Innovation is a knowledge-based process because innovation occurs when different types of knowledge structures are brought together in a meaningful way. This knowledge is made up of open and confidential knowledge that can arise from discussions, experience, and researches on market, technology and competitor. The golden key to a successful innovation is to bring these very different kinds of knowledge together in a time of uncertainty (Tidd et al., 2005). Increasing understanding of the importance of value-added production as an input of knowledge in the creation of innovative products increases the importance of "knowledge management" in production and service processes. Innovation is the use and application of knowledge in the production process. The systematic innovation focus recommends that innovation and knowledge generation take place as a result of a diversity of activities, innovation management techniques and tools, many of them outside the formal research process (Albors et al., 2018). For success in innovation, all business processes need to be developed, improved and the knowledge levels of employees must be increased. In short, the production of knowledge is required (Durna and Demirel, 2008).

The capability of enterprises to create customer value and provide competitive advantage in an environment where knowledge and technology change rapidly is related to how successful innovation management can be. During the innovation management process, it is important that enterprises perceive innovation as the transformation of knowledge into economic activity (Tang, 2006). Today's economy is living the age of knowledge, and enterprises are undergoing a series of innovation strategy implementations. This process, called innovation management process, starts with creative ideas and ends with technological innovation. However, innovation includes not only product or service innovations, but also process, structural, capability innovations. That is why innovation should be thought of as multidimensional rather than one dimensional and should be evaluated accordingly.

The fact that innovation is important for enterprises has resulted in a lot of study being done to determine the innovation capabilities of the enterprises. According to Schumpeter (1966), enterprise size and market structure are key determinants of innovation capabilities of enterprises. Innovation capability is defined as the capability of applying or creating of new products, services, work processes and management procedures to attain competitive advantage for firms (Hui et al., 2018).

The capability of an enterprise to innovate can be considered as the potential of the enterprise to innovate. This depends on how the enterprise uses its existing resources and capabilities, because they allow it to capture new opportunities for the business and to serve its interests (Neely et al., 2001). The concept of innovation capability was first used by Burns and Stalker (1961) to describe an organization's capability to successfully adapt and implement new ideas, products and processes (Hurley and Hult, 1998). Innovation is the capability to effectively adapt the knowledge and skills necessary to develop existing technology and create new technology (Romijn and Albaladejo, 2002). In short, innovation capability means developing and improving the skills of the enterprise to develop new products and meet market needs (Szeto, 2000).

New products and new types of services are created by the fact that the manufacturer's knowledge, imagination, innovation, risk taking, trial and error, capital support that will enable it to survive in the first months of the entrance of the market and develop the product. The development of a new product is always carried out with the quest for innovation and knowledge (Deming, 1996). In summary, information becomes innovation and innovation becomes new products (Emiroğlu, 2018). Innovation and knowledge are the most master factors for firm's success and survival (Rajapathirana and Hui, 2018).

3. RESEARCH METHODOLOGY

Data collected for this study were analyzed using SPSS 22 and AMOS 22 statistical programs. Findings, frequency, and percentages values of participants' demographics were specified, scale reliability was tested by explanatory factor analysis and confirmatory factor analysis was used to test the measurement model and finally the cause-and-effect relationships between the variables were shown using Structural Equation Modeling. The hypothesis to be tested was determined upon the literature review listed below.

H_1: *Knowledge management has a direct effect on the innovation capability.*

> *H_{1a}: Creating knowledge, one of the dimensions of knowledge management, has a direct impact on the innovation capability.*
>
> *H_{1b}: Knowledge sharing and implementation within the organization, one of the dimensions of knowledge management, has a direct impact on innovation capability.*

H_2: *Innovation management has a direct effect on innovation capability.*

> *H_{2a}: Structural innovation, one of the dimensions of innovation management, has a direct impact on innovation capability.*

H_{2b}: Process innovation, one of the dimensions of innovation management, has a direct impact on innovation capability.

H_{2c}: Innovation capability, one of the dimensions of innovation management, has a direct impact on innovation capability.

***H_3**: Innovation capability has a direct effect on the success of new product.*

***H_4**: Knowledge management has an indirect impact on new product success through innovation.*

H_{4a}: Creating knowledge, one of the dimensions of knowledge management, has an indirect impact on the success of new product through innovation capability.

H_{4b}: Knowledge sharing and implementation within the organization, one of the dimensions of knowledge management, has an indirect impact on the success of new product through innovation capability.

***H_5**: Innovation management has an indirect impact on product development success through innovation capability.*

H_{5a}: Structural innovation, one of the dimensions of innovation management, has an indirect impact on new product success through innovation capability.

H_{5b}: Process of innovation, one of the dimensions of innovation management, has an indirect impact on new product success through innovation capability.

H_{5c}: Innovation capability, one of the dimensions of innovation management, has an indirect impact on new product success through innovation capability.

3.1. Participants

R & D, innovation and new product development activities are the most intense and the most innovative in companies within the white goods sector in Turkey. In this context, the staff such as experts, chiefs, engineers, and especially managers (that are the subjects of the research universe) of the departments of R&D, technology development/design etc. were requested to be reached. As a sampling method, non-probabilistic sampling method Judgemental Sampling was chosen.

In the case of non-probability-based sampling methods, samples are not selected by chance, but specific characteristics are sought in the samples to be selected (De Vaus, 1990). In the Judgmental Sampling Method, the researcher decides himself / herself as the best-known person, who is an expert or a judge of the subject, for example, who will be selected (Nakip, 2006). It is believed that the selected sample units represent the target population and serve the purpose of the research (Churchill, 1996). The more homogeneous the main mass (the degree

of similarity between the elements of the target population) and the more knowledge the researcher knows about the main mass, the better results will be given by the selected sample (Teddlie and Yu, 2007). In this study, Judgmental Sampling was conducted in the light of the fact that the white-collar employees included in the research are qualified and knowledgeable individuals with the same qualifications and competence to speak about the subject, who can use the knowledge and technology to create innovative products that work with the brain power. The number of companies participating in the survey and the number of participants is shown in Table 1.

Table 1. Firms and Number of Participants

	Firms	Questionnaires
1	VESTEL	278
2	BSH (BOSH-SIEMENS)	109
3	INDESIT	57
4	CANDY HOOVER GROUP	38
5	SIMFER	35
6	FRANKE	26
7	UĞUR SOĞUTMA	20
8	TERMIKEL	20
9	DEMIRDOKUM	12
10	KUMTEL	5
	Totals	**600**

3.2. Data Collection Method

Necessary permissions were obtained from the subjects to conduct the questionnaires prepared for collecting research data. In order to be able to determine the sampling frame, face-to-face and telephone interviews were made with senior executives of R&D or human resources departments of the companies and a questionnaire form was sent to the departments and people (manager, expert, chef, and technician) on the basis of the numbers the companies determined. After about 3 weeks, the questionnaires that were distributed and sent by mail and e-mails were replied back. In this way, 600 white collar employees in the white goods sector were included in the research.

Table 2. Demographic Profile of the Participants (N=600)

Demographic Specifications	Frequency	Percentage	Demographic Specifications	Frequency	Percentage
Sex			**Department**		
Female	86	14.3	Production/Operation	114	19.0
Male	514	85.7	Accounting/Finance	26	4.3
			Sales/Marketing	10	1.7
Age			R&D/Software	317	52.8
18-25	34	5.7	Tech. Dev./Design	115	19.2
26-35	303	50.5	Human Resources	7	1.2
36-45	198	33.0	Quality Control	8	1.3
46-55	63	10.5	Purchasing	2	0.3
56 and above	2	0.3	Maintenance	1	0.2
			Title/ Status		
Educational status			Manager	109	18.2
High school	42	7.0	Expert	306	51
Undergraduate	68	11.3	Chef	83	13.8
University	422	70.3	Technician	101	16.8
Post graduate	68	11.3	Other(training staff)	1	0.2
			Training for personal development		
			No	265	44.2
			Yes	335	55.8

Of the participants; 14.3% are women; 85.7% are men; 5.7% are between the ages of 18-25; 50.5% are between 26-35; 33.0% are between 36-45; 10.5% are between 46-55; 0.3% are between 56 years old or above. Looking at the educational status of the participants; 7% are high school graduates; 11.3% are undergraduates; 70.3% are university graduates; and 11.3% are post graduates. The educational status of the participants is higher among R&D/software employees (%52.8) than in other department groups. The majority of the questionnaire participants are expert.

3.3. Measurement Tools

The information related to the measurement tools are shown in Table 3 below.

Table 3. Variables and Codes Used in the Scales

Scales		Dimensions and codes	Number of statements	Source
Independent Variable	**Knowledge management**	Knowledge creation (B_Y) Intra-organizational knowledge sharing and application (B_P)	4 5	Tatiana Andreeva and Aino Kianto (2011) *Knowledge Processes, Knowledge- Intensity and Innovation: A Moderated Mediation Analysis* Journal of Knowledge Management, Vol. 15 Iss 6, 1016 – 1034
Independent Variable	**Innovation management**	Structural innovation (Y_A) Process Innovation (S_U) Competence Innovation (Y_E)	8 5 6	Samuel Mafabi, John Munene, Joseph Ntayi (2012)*Knowledge Management and Organisational Resilience: Organisational Innovation as A Mediator in Uganda Parastatals*, Journal of Strategy and Management, Vol. 5 Iss: 1, 57 – 80
Dependent Variable		Innovation Capability (I_Y)	4	Jie Yang (2011) *Innovation Capability and Corporate Growt: An Empirical Investigation in Chine*, Journal of Engineering and Technology Management Vol. 29, Iss 1, 34–46
Dependent Variable		New Product Success (U_B)	4	Andreas Engelen, Malte Brettel, Gregor Wiest (2012) *Cross-Functional Integration and New ProductPerformance-The Impact of National and Corporate Culture*, Journal of International Management, Vol: 18, 52-65

As given in the table, the independent variables are comprised of 5 sub dimensions with 28 statements; the dependent variables are comprised of 2 sub dimensions with 8 statements.

3.4. Testing of Scales Used in Research

The exploratory and confirmatory factor analysis regarding the validity and reliability of the scales used in research are shown below.

3.4.1. Exploratory Factor Analysis

Exploratory factor analysis (EFA) is actualized with varimax rotation and principal components yielded seven factors. Analysis is performed by removing factor loading lower than 0.30.

Table 4. Factor Loads Calculated Using Varimax Rotation

Statements	Factor load	Explained variance (%)	Cronbach Alpha
Knowledge creation		**8,736**	**0,86**
Our organisation uses existing know-how in a creative manner for new applications	0,739		
Our organisation frequently comes up with new ideas about our working methods and processes	0,712		
Our organisation frequently comes up with new ideas about our products and/or services	0,686		
If a traditional method is not effective anymore our organisation develops a new method	0,633		
Intra-organizational knowledge sharing and application		**9,652**	**0,87**
In our organisation information and knowledge are actively shared within the units	0,790		
In our organisation employees and managers exchange a lot of information and knowledge	0,790		
Different units of our organisation actively share information and knowledge among each other	0,785		
Our organisation shares a lot of knowledge and information with strategic partners	0,596		
Structural innovation		**13,146**	**0,90**
We do not review performance plans in our organization	0,753		
We improve our systems of handling organization risks	0,725		
We review the functions of departments in our organization	0,717		
We review our programmes	0,712		
We review the job descriptions of different jobs in our organization	0,635		
We have failed to improve the methods of delivering our services			
We redesign different strategies to meet our objectives	0,506		
Process innovation	0,493		
We design the internet to deliver our services		**6,573**	**0,82**
We do not improve the internet to deliver our services	0,803		
We redesign the flow of work by the use of information communication technology	0,701		
Competence innovation	0,563		
We improve our conduct of handling information resources		**12,167**	**0,89**
We make new networks for our organization	0,727		
We improve our task performance behaviours	0,716		
We change our behavior of handling organizational resources	0,716		
We do not improve our customer service behaviours	0,669		
We improve our leadership behaviours	0,627		
	0,545		
Firm innovation capability		**9,161**	**0,86**
Our firm placed emphasis on creativity through substantial investment in R&D.	0,768		
Our firm has harnessed organizational intelligence and managed technology to increase innovation.	0,726		
Our firm is able to identify and create new value for customers.	0,642		
Our knowledge and skill base is building up at the right pace.	0,634		
New Product Success		**10,608**	**0,89**
In relation to our original objectives, sales volume for our recently developed products/services is…	0,805		
In relation to our competitors, market share for our recently developed products/services is…	0,799		
In relation to our competitors, profitability for our recently developed products/services is…	0,770		
In relation to our competitors, sales volume for our recently developed products/services is…	0,745		
Kaiser Meyer Olkin Measure of Sampling Adequacy.	0,954		
Bartlett's Test of Sphericity	Approx.Chi-Square 12728,476 Df 496 Sig. 0.000		

70,044 % of the total variance is explained by the *7 factors model*. In given factor loads ranging from 0,493 to 0,805. Data shows that requirements of structure and separation of the *7 factors model* are met. Cronbach alpha indexes are calculated with the SPSS software, version 22 for scale reliability. Cronbach alpha indexes in table 4 shows that all indexes are above 0,70. Acquired data shows that the scale is reliable.

3.4.2. Confirmatory Factor Analysis

Confirmatory factor analysis in the study was done with SPSS AMOS 22 program. First-level multi-factor confirmatory factor analysis was conducted for *knowledge management and innovation management scales*. In this analysis, the relationship between the created factors (latent variables) was included in the model, the variables were mutually connected, and the first level analysis was performed. A single factor confirmatory analysis was performed within the *innovation capability and new product success* scales. Again, all the items were connected and tested with a single latent variable (factor). As a result of confirmatory factor analysis, it was observed that model adaptation values of 36 variables included in the scale were not at acceptable level. As a result of the analysis, the proposed modifications were made and a total of 31 expressions were left. The post-modification values are shown in Table 5.

Table 5. Concordance Values of the Scales

	X^2	**df**	**x^2/df**	**GFI**	**CFI**	**RMSEA**
Knowledge management scale	62,017	13	4.771	0,97	0,98	0,079
Innovation management scale	421,267	101	4.171	0,92	0,94	0,073
Firm innovation capability scale	0,263	1	0,263	1	1	0,000
New product success scale	3,973	1	3,973	1	1	0,070
Good concordance values			**≤2**	**≥0,95**	**≥0,95**	**≤0,05**
Acceptable concordance values			**≤5**	**≥90**	**≥90**	**≤0,08**

In view of the findings in Table 5, 2-dimensional structure of knowledge management scale, 3-dimensional structure of innovation management scale, and one-dimensional structure of innovation capability and new product success scales were confirmed and modeled. The non-standardized regression coefficients, standardized regression coefficients, standard factor load, standard error, measurement error variance, critical ratio, P value and R^2 correlation values of the variables in the measurement model are given in Table 6.

Table 6. The Outcomes of the Measurement Model

	Std. Factor Load (r)	Non-std. Factor load	Std. Error	Measurement Error Variance	CR Value	p Value	R^2
BY1	0,886	1,000	0,045	0,216	23,645	0,000	0,784
BY2	0,872	1,045	0,043	0,240	24,545	0,000	0,760
BY4	0,668	0,751	0,042	0,554	17,900	0,000	0,446
BP1	0,829	1,000	0,040	0,313	21,250	0,000	0,687
BP2	0,850	1,020	0,044	0,278	23,270	0,000	0,722
BP3	0,796	0,985	0,046	0,366	21,556	0,000	0,634
BP4	0,659	0,782	0,046	0,566	16,946	0,000	0,434
YA1	0,668	1,000	0,074	0,554	16,550	0,000	0,446
YA2	0,780	1,260	0,075	0,392	16,865	0,000	0,608
YA3	0,786	1,310	0,077	0,383	16,970	0,000	0,617
YA4	0,750	1,266	0,078	0,438	16,309	0,000	0,562
YA5	0,771	1,156	0,069	0,406	16,701	0,000	0,594
YA7	0,784	1,292	0,076	0,385	16,950	0,000	0,615
YA8	0,718	1,118	0,071	0,484	15,715	0,000	0,516
SU1	0,706	1,000	0,067	0,502	16,584	0,000	0,498
SU2	0,831	1,230	0,068	0,309	18,026	0,000	0,691
SU3	0,817	1,214	0,068	0,333	17,808	0,000	0,667
YE1	0,734	1,000	0,058	0,462	19,250	0,000	0,538
YE2	0,761	1,029	0,056	0,422	18,226	0,000	0,578
YE3	0,796	1,111	0,058	0,367	19,105	0,000	0,633
YE4	0,760	1,099	0,060	0,422	18,212	0,000	0,578
YE5	0,761	0,976	0,054	0,420	18,249	0,000	0,580
YE6	0,730	0,997	0,057	0,468	17,456	0,000	0,532
IY1	0,748	1,000	0,063	0,440	18,632	0,000	0,560
IY2	0,881	1,333	0,069	0,223	19,247	0,000	0,777
IY3	0,719	0,904	0,055	0,482	16,583	0,000	0,518
IY4	0,745	1,126	0,065	0,445	17,220	0,000	0,555
UB1	0,725	1,000	0,062	0,475	18,476	0,000	0,525
UB2	0,780	1,096	0,053	0,392	20,854	0,000	0,608
UB3	0,842	1,249	0,065	0,290	19,104	0,000	0,710
UB4	0,880	1,272	0,065	0,225	19,487	0,000	0,775

When the factor load values of the measurement model in Table 6 are examined, it is seen that the factor load value of each item is over 0.50. According to Hair et al. (1998), an item is reliable if the factor load value is greater than 0.50. Parameters which have a Critical Ratio Value (C.R.) greater than -1.96 or +1.96 are considered statistically significant. The critical ratio is the value obtained by dividing the estimate of parameter by the standard error (Byrne, 2010: 68). All the critical rate values in Table 6 are greater than + 1.96 and significant. In summary, when the values in Table 6 are examined, it is seen that convergent validity of the scales is provided.

4. FINDINGS

4.1. Correlation Findings

In addition to factor analysis, correlation analysis, one of the methods used to measure construct validity, is a technique used to measure the degree and direction of the relationship or dependence between the two variables. Correlation coefficients are indicated by "r" and are between -1 and +1. The coefficient +1 points to the perfect linear relationship between the two variables (Altunışık et al., 2012).

The correlations between the variables of the research scales are presented in Table 7. Pearson Correlation is used as the data obtained by the Explanatory Factor Analysis is parametric. The findings show there is a relationship between innovation capability and new product success, which are dependent variables of research, and knowledge management dimension (sharing knowledge within the organization, creating knowledge), and innovation management dimension (structural, capability, process innovation), which are independent variables of research.

Table 7. Correlations for the Variables

BY	BP	YA	SU	YE	IY	UB	
BY	(0,814)						
BP	0,602	(0,787)					
YA	0,584	0,609	(0,752)				
SU	0,526	0,472	0,644	(0,786)			
YE	0,585	0,522	0,689	0,681	(0,757)		
IY	0,641	0,524	0,568	0,570	0,631	(0,776)	
UB	0,475	0,394	0,577	0,490	0,539	0,564	(0,809)
p<0,01							

** p<0,01

Innovation capability, one of the dependent variables of the study, has a meaningful and positive relationship with the knowledge creation dimension (r=0.641, p<0.01) and the knowledge sharing dimension (r=0.524, p<0.01) of the knowledge management scale, the process innovation dimension (r=0.568, p<0.01) of the innovation management scale (r=0.570, p<0.01), and the capability innovation dimension (r=0.631, p<0.01) and the other dependent variable of the study, the success of new product (r=0.564, p<0.01).

The success of the new product, the other dependent variable of the study, has a meaningful and positive relationship with the knowledge creation (r=0,475, p<0.01), knowledge sharing (r=0,394, p<0.01), structural innovation (r=0,577, p<0.01), process innovation (r=0,490, p<0.01) and talent innovation (r=0,539, p<0.01).

When we analyze the relationship between independent variables, there is a positive and meaningful relation between knowledge creation and knowledge sharing (r=0,602, p<0.01), structural innovation (r=0,584, p<0.01), process innovation (r=0,526, p<0.01) and talent innovation (r=0,585, p<0.01); knowledge sharing and application within the organization and structural innovation (r=0,609, p<0.01), process innovation (r=0,472, p<0.01) and talent innovation (r=0,522, p<0.01); structural innovation and process innovation (r=0,644, p<0.01) and talent innovation (r=0,689, p<0.01); process innovation and talent innovation (r=0,681, p<0.01).

The values indicated by the parentheses on the diagonal in Table 7, where the correlations and square root AVE values for each structure are shown, are the square root values of the variances of the explained variances of each structure. The values in the columns and rows outside the diagonal are the correlations between the factors. In order to be able to speak of separation validity, the values on the diagonals must be greater than the values in the column and row on the diagonal (Fornell and Larcker, 1981). The square root AVE values of *knowledge creation, knowledge sharing and implementation, structural innovation, process innovation, capability innovation, innovation capability and new product success* factors are 0.814, 0.787, 0.752, 0.786, 0.757, 0.776, 0.809 respectively. When the table is examined, it is observed that these values are greater than the correlations between the factors. Thus, the discriminant validity of these values compared to the square rooted values is achieved by considering the AVE values given in Table 8.

4.2. AVE Values, Validity and Reliability of Factor Loads

In order to be able to fulfill the discriminant validity, the square rooted value of AVE is checked. It is decided that the discriminant validity is satisfied if the square rooted values of the AVE are greater than the values between the dimensions of the same structure. AVE values are expected to be equal to or higher than 0.50 (Fornell and Larcker, 1981: 46). As shown in Table 8, the mean variance values of all the factors in the study are 0.663, 0.619, 0.565, 0.618, 0.573, 0.603 and 0.654, respectively, and the convergent validity is achieved as the values are above 50%.

Table 8. Validity and Reliability of Factor Loads

Factors	Average Variance Extracted AVE >0.50	Cronbach Alpha α>0.70	Composite Reliability CR>0.70
BY (Knowledge creation))	0,663	0,873	0,853
BP (Intra-organizational knowledge sharing and application)	0,619	0,867	0,866
YA (Structural innovation)	0,565	0,900	0,900
SU (Process innovation)	0,618	0,823	0,829
YE (Competence innovation)	0,573	0,889	0,890
IY (İnnovation capability)	0,603	0,861	0,857
UB (New product success)	0,654	0,889	0,883

According to Hair et al. (1998), the AVE value for coherence was greater than 0.5; CR ratio should be greater than AVE (CR> AVE> 0.5). As shown in Table 8, the CR value of each structure is greater than the AVE value.

4.3. Structural Equation Modeling

The structural equation model for testing hypotheses of the research is presented in Figure 2.

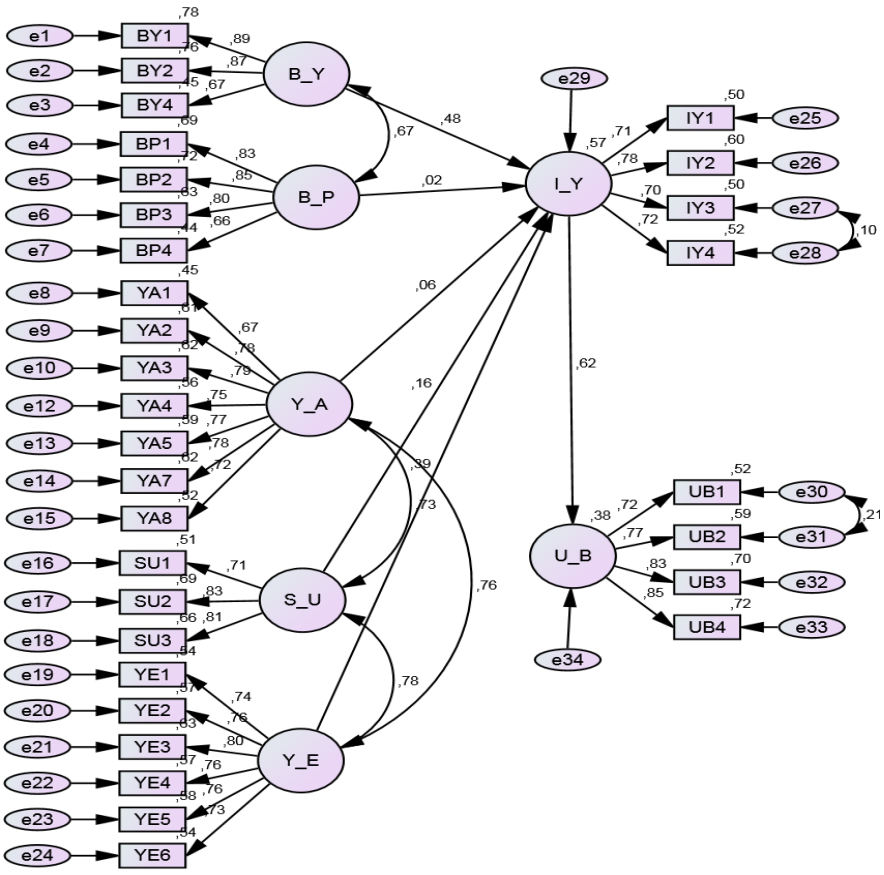

Figure 2. Path Diagram of Structural Equation Modeling

In the path diagram of AMOS in Fig. 2, the correlation between the factors is expressed by the values on the arrows of the bi-directional arc between the latent variables. These arrows do not show the causal-result relationship between variables, but are equivalent to the correlation or covariance value, and do not show the direction of the relationship in short.

The fit index values of the model in Figure 2 are shown in Table 9. The values in the table indicate that the fit index values of the generated model are within acceptable limits.

Table 9. The Concordance Values of Structural Equation Model

Scales	**x^2**	**df**	**x^2/df**	**GFI**	**CFI**	**RMSEA**
Concordance values	1644,978	422	3,898	0,86*	0,90	0,070
Good concordance values			≤2	≥0,95	≥0,95	≤0,05
Acceptable concordance values			≤5	≥90 ≥0,85*	≥0,90	≤0,08

When the table of fit indexes of the structural model is examined, it can be said that the values of this study are between the acceptable measures, in other words, there is an agreement between the model and the observed data, the proposed model adapts to the acceptable level. The X^2 fit index, which cannot be assessed alone, has significance as compared to the degree of freedom. The X^2 / df value is 3.89. Models with this value between 2 and 5 in the literature are considered as acceptable models (Şimşek, 2007; Meydan and Şeşen, 2011). Some values such as GFI (goodness of fit index-0.86 *) in the table are close to acceptable threshold or below the threshold can be explained by sample size or model complexity. Anderson and Gerbing (1984); Schermellelh-Engel and Moosbrugger (2003); Jöreskog and Sörbom (1981) reported that GFI fit index of 0.85 and above was acceptable; Eid (2012) reported that the GFI fit index above 0.80 was acceptable. The root mean square error of approximation (RMSEA) was less than 0.08 (0.070) and fulfilled the condition (Hair et al., 1998, Bryne, 2010). The CFI (comparative fit index) value was acceptable at 0.90. Standardized β coefficients, standard error, critical ratio and p values between the variables based on the study model are presented in Table 10.

Table 10. Coefficients of Structural Equity Model

Variables	β	Standard error	Critical ratio (cr)	p
Knowledge creation-Firm innovation capability	0,48	,058	7,898	***
Intra- organizational knowledge sharing and application- Firm innovation capability	**0,02**	**,041**	**,461**	**,644**
Structural innovation-Firm innovation capability	**0,06**	**,050**	**,843**	**,399**
Process innovation- Firm innovation capability	0,16	,060	2,213	**,027**
Competence innovation-Firm innovation capability	0,39	,061	4,998	***
Firm innovation capability- New Product Success	0,62	,057	11,389	***

When the values in the table were examined, it was found that there was no statistically significant relationship between the organizational knowledge sharing dimension of the management variable and structural innovation dimension of the innovation management as the innovation capability is p> 0.05. H_{1b} and H_{2a} hypotheses are therefore not supported.

The knowledge creation dimension of knowledge management variable has an impact on the innovation capability (β = 0.48, p <0,05); process innovation dimension of innovation capability variable has an impact on innovation capability (β = 0,16; p <0,05); capability innovation dimension has an impact on innovation capability (β = 0.39, p <0.05) and innovation capability has an impact on new product success (β = 0.62, p <0.05). Based on these findings, hypotheses H_{1a}, H_{2b}, H_{2c} and H_3 have been supported. Table 11 shows the β coefficients indicating the indirect effects between the variables based on the constructed structural model.

Table 11. Indirect Effect Between Variables

Variables	β
Knowledge creation-Firm innovation capability- New Product Success	0,30
Intra- organizational knowledge sharing and application- Firm innovation capability- New Product Success	**0,02**
Structural innovation- Firm innovation capability- New Product Success	**0,03**
Process innovation- Firm innovation capability- New Product Success	0,10
Competence innovation-Firm innovation capability- New Product Success	0,24

When the values in the table are examined; creating knowledge dimension of knowledge management variable has an impact on the success of new product through innovation capability (β = 0,30; p <0,05); process innovation dimension of innovation capability has an impact on the success of new product through innovation capability (β = 0,10; p <0,05); innovation capability dimension has an impact on new product success through innovation capability (β = 0,24; p <0,05). Based on these findings, hypotheses H_{4a}, H_{5b}, and H_{5c} have been

supported however hypotheses H_{4b} and H_{5a} have not been supported. The results of the hypothesis in conformity with these findings are provided in Table 12.

Table 12. Hypothesis Results of The Research Model

Hypothesis	Result
Direct impact hypotheses of the research	
H_1: Knowledge management has a direct effect on the innovation capability.	
H_{1a}: Creating knowledge, one of the dimensions of knowledge management, has a direct impact on the innovation capability.	Supported
H_{1b}: Knowledge sharing and implementation within the organization, one of the dimensions of knowledge management, has a direct impact on innovation capability.	Not supported
H_2: Innovation management has a direct effect on innovation capability.	
H_{2a}: Structural innovation, one of the dimensions of innovation management, has a direct impact on innovation capability.	Not supported
H_{2b}: Process innovation, one of the dimensions of innovation management, has a direct impact on innovation capability.	Supported
H_{2c}: Innovation capability, one of the dimensions of innovation management, has a direct impact on innovation capability.	Supported
H_3: Innovation capability has a direct effect on the success of new product.	Supported
Indirect impact hypotheses of the research:	
H_4: Knowledge management has an indirect impact on new product success through innovation.	
H_{4a}: Creating knowledge, one of the dimensions of knowledge management, has an indirect impact on the success of new product through innovation capability.	Supported
H_{4b}: Knowledge sharing and implementation within the organization, one of the dimensions of knowledge management, has an indirect impact on the success of new product through innovation capability.	Not supported
H_5: Innovation management has an indirect impact on product development success through innovation capability.	
H_{5a}: Structural innovation, one of the dimensions of innovation management, has an indirect impact on new product success through innovation capability.	Not supported
H_{5b}: Process of innovation, one of the dimensions of innovation management, has an indirect impact on new product success through innovation capability.	Supported
H_{5c}: Innovation capability, one of the dimensions of innovation management, has an indirect impact on new product success through innovation capability.	Supported

5. CONCLUSION

The amount and quality of knowledge that the enterprise needs during the innovation activities and how the knowledge is provided are the basis of knowledge management. Innovation, a knowledge-based process, is an important competitive tool that facilitates the entry of new markets, enabling businesses to increase productivity, profitability and growth. The success of the innovation process with a successful product is made possible by efficient and effective management that requires thorough and rigorous work. Effective management of knowledge and innovation will enhance the enterprise's capability to innovate and then succeed in new products.

The findings obtained by correlation analysis show that there is a relationship between dependent variables of the research - innovation capability and new product success-and

independent variables of the research - knowledge management dimensions (organizational knowledge sharing, knowledge creation) and innovation management dimensions (structural, capability, process innovations).

When the table of fit indexes of the structural model is examined, it can be said that the values of this study are between the acceptable measures. In other words, there is an agreement between the model and the observed data, and the proposed model adapts to the acceptable level. The X2 / df value of the structural model was 3.89, the GFI (Goodness of Fit Index) was 0.86, and the RMSEA was below 0.08 (0.070). The CFI value is acceptable at 0.90.

The critical ratio value greater than 1.96 confirms that the meaningfulness of the hypothesis. Accordingly, when we look at the coefficients in the structural model, there was no statistically significant relationship between the organizational knowledge sharing dimension of the knowledge management variable and innovation capability with the structural innovation dimension of the innovation management variable as the value was p> 0,05. More explicitly, organizational knowledge sharing and implementing from the dimension of knowledge management and structural innovation form the dimension of the innovation management did not have any effect on innovation capability. As a result of the study, it has emerged that knowledge sharing is not enough. Although sharing knowledge between the employees and the management, especially from the time of the birth of the idea of new product development to the presentation of this product to the market, is of great importance, the employees have shared views that they are not regularly notified of changes in procedures, instructions and regulations, thus it is concluded that knowledge sharing is not enough based on the results of the study. In addition, a large proportion of participants indicated that they did not believe that different strategies were redesigned to achieve their goals and that they were successful in providing timely service to customers. These variables, which were evaluated within the scope of structural innovation, appeared to have little effect on the innovation capabilities of the enterprises.

The activities such as developing new ideas continuously for developing new products, using today's technical knowledge and technology, improving Internet infrastructure, eliminating activities that do not benefit enough, improving leadership behavior, improving customer service understanding and using business resources effectively and efficiently helps the enterprises in the white goods sector improve their innovation skills. The development of enterprise's innovation capabilities also provides a competitive advantage by causing an increase in sales volume of products and services. As a result, both the market share of the products and services developed by the sector companies in recent times compared to their

initial targets and the profitability of the products and services compared to their competitors are increasing.

When the results of the research were examined, it was found that the study was similar to the other empirical studies that were carried out before. For example, Daud et al. (2008) found a significant positive relationship between knowledge management process and enterprise success / performance. Moreover Rastgoo (2017) found a significant relationship between strategic knowledge management and innovation. In Saunila and Ukko's (2014) studies, innovation capability as a performance enhancing tool in SMEs in Finland has been found to have a positive effect. In Rundquist et al. (2010), the development and integration of knowledge has had a positive impact on the new product development process, and good companies have focused on knowledge issues. In his study, Bakkal (2018) demonstrated a strong and meaningful relationship between information sharing and service innovation.

5.1. The Suggestions Presented to the Managers in the White Goods Sector

In the light of the previous research and as a result of literature review, the suggestions presented to the managers in the white goods sector are as follows:

• The white goods sector is one of the locomotive sectors of our country in the economic sense because it is a sector that has a lot of R&D activities that is intensive and open to innovation and that makes serious investments in developing new products. Therefore, decision makers can provide more efficiency in knowledge and innovation management for market success; collect innovation-related data, knowledge and produce technologies of tomorrow, not today, by closely following technological developments through knowledge dissemination.

• The white goods sector has a wide range of products due to the different technologies it has. Although R&D activities in the white goods sector in Turkey are mostly focused on improving the quality of a product, design-model development and product development, the number of patents in the sector is far below the developed countries. For this reason, management can firstly increase the support given to R&D by inculcating a sense of responsibility and ownership in R&D/Product development team, and they can protect intellectual property rights of the new products developed.

• A large number of participants do not believe that different strategies have been redesigned to achieve their business goals and that they are successful in providing timely service to customers. According to the results of the research, the impact of structural innovation on innovation capability and new product success has not been determined. In order to design different strategies and provide timely service to customers, managers can target improvement,

development and innovation in all business units, and in line with these sustainable objectives, they can foresee the future and transfer business plans to the future.

• Business decision makers can follow the general trends of the market and act as partners in meeting the needs of the society and even exceeding the expectation, producing aesthetic, multifunctional nature and innovative products for new consumption habits. In other words, they can evaluate the new product development projects as a whole (a systematic process) with the understanding of system approach.

• The white goods sector managers can be encouraged to regularly provide current trainings to relevant employees on topics such as innovation, patent, knowledge, technology, R&D. In particular, TRIZ (Creative Problem-Solving Theory) system, which is the formula for making inventions, can be taught to engineers.

• As a result of the research, it was found that the employees of the enterprise share the view that they are not regularly informed about the changes of the procedures, directives and regulations and the organizational knowledge sharing and implementation have no impact on the innovation capability of the enterprises and the success of the new product. Business decision makers can incorporate internal and external sources of innovation into the innovation process to create and implement innovative ideas so that enterprises of knowledge and knowledge can improve their innovation capabilities and achieve success in the new business. In addition, managers can revise success and performance evaluation systems so that innovative and creative ideas can be used to develop product. In particular, this issue can be addressed within the framework of career development and rewarding. Otherwise, knowledge and innovative ideas may not be shared with the enterprise and confined to the workplace. In order to achieve success in the new product, managers may attempt to establish a learning organization so that the creation of knowledge, the incorporation of knowledge into the innovation process, the transfer and transformation of knowledge into a value can be achieved. For this, the ability to learn and act together in teams also needs to be developed within the enterprise.

5.2. Limitations of the Study

The limitations of the study are as follows:

• Limitation of the research only to the companies in the white goods sector that have a factory and manufacture in Turkey.

• Answering the survey questions in the research only by white-collar workers in the white goods sector.

• The possibility that white-collar employees, especially managers, who participated in the survey did not respond objectively to the questions due to the fact that the answers are based on personal perception.

• The possibility of differences between the current situation and personal perceptions.

• It was very difficult and time consuming because it was the field innovation that the white-collar, especially the managers, was the subject of the analysis of the research, to reach the authorized person and to obtain the necessary permits.

•It was very difficult and time consuming to reach the authorized person and to obtain the necessary permits in the study area of innovation as the subject of the analysis part is about the white-collars, especially the managers.

Although it is not possible to make a generalization for all sectors in Turkey due to a number of restrictions in the research, it is expected that the results will be useful for similar studies.

5.3. Suggestions for Future Researches

The following suggestions are presented for the researchers for future research on knowledge management, innovation management, innovation capability and new product success:

• The research was carried out with companies operating in the white goods sector and manufacturing in Turkey. A similar research can be carried out with different companies and different sectors in Turkey, and it can also be carried out and compared with foreign companies.

• In order to provide data entry in the research section of this study, the steps of interviewing with companies and ensuring participation in the survey were completed in a short time due to time constraints. A similar research in the future can be extended to a longer period of time and repeated periodically to gain the ability to compare.

• Other, more comprehensive and different scales can be used for the scales used in the research.

In the light of recommendations presented to business managers based on the findings obtained of this research, it can be said that R&D studies in the white goods sector in Turkey mostly consist of quality improvement, design development and product adaptation and new product development activities, but still the number of patents in Turkey is far below the developed countries. The most important factor in the dissemination of innovation, protection of the owner of innovation and the effective use of R&D expenditures is to increase Management's support for R&D applications and to protect intellectual property of developed new products.

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