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Knowledge Management Strategy as the Key Factor for Turkish Firms' Innovation in the Digital Era

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***Abstract*—*The digital era is characterized by technological advancements that enhance the speed and breadth of information and knowledge turnover in businesses, markets, the economy, and society. The success of businesses in the digital era depends heavily on their access to sufficient knowledge and information about changes in the market and business environment. The main objective of this research is to investigate the impact of organizational knowledge management strategies on firms' innovation and absorptive capacities. Using data from 507 employees working in R&D departments of companies that produce white goods, this study aims to test the mediating role of absorptive and innovation capacities in the relationship between knowledge management strategy and firm's product innovation performance. Our results from Turkey confirmed the positive impact of organizational knowledge management strategy on firm's absorptive and innovation capacities, which in turn improves the firm's product innovation performance.*

Key words: Dynamic capability, knowledge management, innovation, absorptive capacity, product innovation performance

1. INTRODUCTION

THE market changes quickly and customers preferences for products and services are varying over time [1]. Investing on product innovation enables companies to satisfy the upcoming customers needs [2], [3]. To predict the needs of customers, companies must be well informed about what goes on and the business environment. In this digitalization era, the firm's ability to collect, store, analysis, and disseminate the market and business environment information is critical for their survival [4]. Therefore, knowledge is one of the most valuable strategic resources for successful organizations [5]. Companies that actively enrich their knowledge about the market, customers, and competitors are one step ahead of their competitors [6], [7]. They are in a better position to predict and satisfy their customer needs by innovative products and services [8]. Therefore, one of the objectives of this research is to provide empirical evidence for the positive impact of organization knowledge management on their innovation capacity.

Having access to knowledge and information about the market and business environment enables companies to achieve a sustainable competitive advantage [8], [16]. The companies must be able to enrich their knowledge by rigorously analyzing the internal environment and external environment factors, but also, they should be able to assimilate and use the market knowledge effectively [9]. In this research, we predicted that the organization knowledge management is an important factor for enriching firms' absorptive capacity. According to Santoro et al. [10], absorptive

capacity refers to the firm's ability to assimilate, analyze, and replicate new knowledge gained from the external environments. An appropriate level of knowledge management within the company assists firms to collect, accumulate, and store external information for internal uses, especially in the design making process. Following Bobrowski [11], we believe that absorptive capacity of firms mainly results from a prolonged process of investment on internal and external knowledge accumulation.

With knowledge management, the company mainly enriches its internal knowledge database and with absorptive capacity the companies enrich its knowledge from external sources. The possibility of reaching a creative and innovative ideas for new product development will be higher if companies successfully spread the acquired information from external sources within different internal departments and divisions [12], [13], [14]. Having sufficient information from the external business environment can increase the chance of innovative products in the market. The new and innovative products will meet the needs and demands of the customers more effectively if the company may have clear information and knowledge about their preferences [15], [16].

The speed of changes in the market is unpredicated in most of times, which makes the failure rate in the business innovation activities almost high [1]. The businesses always look for a strategy or tactics, which maximize their innovation success in the market [2], [3]. Our research contributes to the current literature [1], [12], [13] by highlighting the importance of organization ability in managing and centralizing company information, data, and knowledge for improving the company innovation performance. Innovation is critical factor for many companies to success and survive in this digital era. According to our findings from Turkey, the businesses that utilize their internal and external knowledge resources more effectively are in better strategic position to be innovative.

Knowledge management not only help businesses to improve communication among employees, which is essential for having more creative and innovative ideas within the company and having more informed decisions within the company. Our research also highlighted the important role firm's absorptive capacity—the firms' capability to recognize the value of new external information and data, assimilate these new information and apply them for business purposes—in success or failure of firm's innovation activities. It seems that both external knowledge access and internal absorptive capacity are important for a business's innovation and performance.

Our research has some managerial implications. First, knowledge management strategy plays a critical role on firm's innovation activities. Second, for increasing chances of new and innovative products success on the market, the company must invest more in absorptive capacity. Enriching absorptive capacity can help business to transform valuable external knowledge into own innovations and enhance the success rate of new products in the market.

2. Literature Review

2.1. Knowledge Management

Knowledge management (KM) refers to the process of capturing, sharing, and utilizing knowledge within an organization to improve performance and create value. Knowledge management involves creating a culture of knowledge sharing, identifying, and capturing knowledge, organizing, and storing knowledge, and utilizing knowledge to drive innovation and decision-making [17]. Knowledge management can be explained in the form of preparing the necessary infrastructure for the implementation of the idea, by establishing the necessary infrastructure for the implementation of the idea, obtaining the data needed for the idea to become functional, by establishing the control mechanism by evaluating the time required to put the raw material and the data they need to realize their ideas within the plans [18].

Knowledge management can assist companies to save the internal knowledge from their employees' experiences over time. In case of retirement or leaving due to any reason, the company do not lose the knowledge anchored in employees' minds over the years of working [6]. Knowledge management is a continuous internal process that transforms employee knowledge into organizational knowledge [17]. The different internal departments and divisions can benefits from creating, accumulating, analyzing, organizing, and utilizing internal knowledge [19], [20], [21]. The company enriches its knowledge management by using information and knowledge acquired from different internal and external sources, e.g., customer feedback systems, informal and formal communications among top executives, brainstorming sessions among project managers, mentoring programs for employees, collaboration with suppliers, partners, and competitors.

Therefore, knowledge management is a critical component of organizational success, enabling organizations to leverage their knowledge assets to drive innovation and improve performance [21]. By creating a culture of knowledge sharing, capturing, and organizing knowledge, sharing, and

disseminating knowledge, and utilizing knowledge to drive value, organizations can differentiate themselves from competitors, attract and retain top talent, and achieve strategic objectives.

2.2. Innovation Capacity

Innovation capacity describes an organization's ability to innovate and create new products, processes, or services that meet customer needs and create value [22]. Innovation capacity involves a combination of resources, capabilities, and organizational structures that enable an organization to generate and implement new ideas [18]. İnnovation capacity is critical for organizations that want to stay competitive and grow in today's rapidly changing marketplace. By investing in resources, capabilities, and organizational structures that support innovation, organizations can differentiate themselves from competitors, develop new products and services that meet customer needs, and create long-term value for stakeholders.

Innovation is one of the most important sources of sustainable competitive advantage. Because innovation increases the value of its product portfolio, helps companies survive, and enables them to develop more dynamic products through continuous progress. For this reason, innovation is considered valuable for companies to gain and maintain competitive advantage and implement the entire strategy [23]. Sharing useful knowledge and skills within an organization also reduces the risks of innovation. This is especially important for small and medium-sized companies. Because such companies do not exactly have the resources to develop innovation and commercialize innovation. Therefore, it is important that the culture of innovation can be provided within the organization. Because more innovative ideas, risk sharing, access to new technologies, access to the new market, lower production and R&D costs, innovation development rate, acquisition of innovative resources can be thanks to the culture of innovation [24].

Companies can develop their innovation capacity by carrying out R&D activities to create technological knowledge that will allow them to gain a competitive advantage with technological innovation [19], [25]. Innovation capacity represents the technological level of a company and is often used in place of each other in other terms, such as innovation capacity, technological capacity, and technological capability [26]. Companies can be in essential position in their market by gaining a competitive advantage thanks to their innovation capacity and maintaining this advantage in all strategy applications [27]. If the innovation capacity is successfully developed, the company will also be able to succeed in innovation performance. Therefore, to achieve success in a rapidly changing environment and to maintain it, companies need to be able to manage their resources, assets, and capabilities well. Because the concept of innovation includes many aspects such as management, leadership, and technical aspects, as well as strategic resource allocation, market knowledge, organizational incentives, etc. Within this scope, both the independent and mediation effect of innovation capacity is examined.

2.3. Absorptive Capacity

Absorptive capacity refers to an organization's ability to acquire, assimilate, transform, and exploit knowledge from its external environment [11]. Companies need to adapt external knowledge according to their specific needs to gain an advantage. Companies may need to combine the external knowledge acquired for the development of new products or processes with some of their available knowledge [28]. External knowledge obtained by absorptive capacity can have a significant impact on business product innovation [29]. With the correct use of the knowledge obtained by the company, organizing and making knowledge ready for use under the current competitive conditions can contribute to the company's success in innovation practices [30]. In this context, the quantity and quality of external knowledge flows must be considered [31].

The life curve of each new product entering the market is getting shorter and shorter, which can be seen especially in technological products. Because the constant change of customer requests and needs, the replacement of traditional capital assets such as natural resources and labor with knowledge and intellectual assets in today's competitive environment has shortened the life curve of technology products. Therefore, being able to compete by offering innovative products continuously requires dynamic organizational capabilities [32].

Absorptive capacity is based on the company's knowledge resources and existing knowledge and affects the company's innovation performance [33]. Absorptive capacity is one of the most important elements of the knowledge-based approach. To benefit from external knowledge, a company must have absorptive capacity [28]. In addition, the acquisition and assimilation of new external knowledge enables the renewed and strengthening of absorptive capacity and knowledge [34]. Attempts to gain access to different and new sources of external knowledge are determined by the absorptive capacities of companies, how external knowledge is defined, and how knowledge bases are used [35]. Current studies in the literature have investigated the impact of a

company's absorptive capacity on innovation applications and stated that absorptive capacity has a positive impact on innovation performance [36]. The role of assimilated capacity on innovation has been highlighted in many studies in the literature [36], [37], [38].

2.4. Product Innovation Performance

Product innovation refers to the development of new or improved products that meet customer needs and demands and eventually create value for the business [39]. Product innovation can take various forms, including the introduction of new products, the enhancement of existing products, and the replacement of outdated products. The main goal of product innovation is to produce a new and different product or service. It is necessary to understand the role of the innovation process to understand, adopt, and manage the innovation process. Innovation process: as a system of organized activities, technology enables the transformation of ideas into commercial value [40]. However, at the end of the process, success in the commercial sense is not always possible. For product innovation performance to be successful, it can be effective in the organizational structure to have both the capacity and the ability to innovate, as well as to assimilate the knowledge learned [41]. Innovation process: the best organization of invention, development, or engineering covers market development, sales, and user adoption stages [42]. But invention is not necessary for innovation. Invention is a rare idea. It is also not enough that an idea has commercial meaning. Innovation is as much an intraorganizational process. Because of product innovation performance, companies want to make a change around them by developing products and processes that are riskier and newer in terms of quality, and when they are successful, they can drive the sector by improving their economic situation [43].

The innovation process should be planned and foreseen, as opposed to the fact that there is no process left by coincidence in organizations. Managing innovation really requires the determination, planning, and implementation of relevant plans. By recognizing that innovation is a process to manage innovation as planned, new ideas must be created and implemented in this process needs to be well organized. An innovative movement that has been implemented systematically for businesses can be effective. To be able to do innovation, there is consensus that scientific research, technological development, and market needs are effective. In the early years when business-level innovation activities accelerated, innovation was generally managed as a communication-based process between technological development and marketing [44]. It is understood that environmental factors should be included in the process to increase the success of innovation over time [45]. Within this scope, the effects of knowledge management, innovation capacity, and assimilated capacity on product innovation performance are examined.

2.5. Hypothesis Development

Company-level innovation capacity refers to a company's R&D efforts for process or product innovation. R&D activities can be considered as the basis for producing technological knowledge in companies. It can be argued that knowledge management is necessary to produce this information. For this purpose, knowledge management may have an impact on product innovation performance. However, a high level of innovation capacity creates technological knowledge in companies, and the more knowledge they have, the more innovation they can produce [46]. Innovation can only happen if the company has innovation capacity. To use this capacity, capability is also needed. According to Harvard Business School Professor Clayton Christensen, there are more than 30 000 new products launched each year, and 95% fail. According to University of Toronto Professor Inez Blackburn, the failure rate for new grocery products is 70% to 80%. In this situation, a significant portion of the investments made in R&D departments are wasted because the success rate of new products launched every year is quite low. For this reason, it is necessary to pay close attention to knowledge management in R&D departments.

Knowledge management can have a significant impact on generation of new ideas within firms and firm's product innovation. Knowledge management can help organizations generate new ideas for product innovation [46]. By capturing and sharing knowledge across the organization, organizations can tap into the expertise of employees and identify new opportunities for innovation. Knowledge management can help organizations bring products to market faster by reducing the time it takes to develop and launch a new product [24]. By sharing knowledge about customer needs, market trends, and competitor offerings, organizations can develop products that meet customer needs more quickly. Enhanced collaboration is another benefit of knowledge management and is another way which can impact on firms' innovation activities. Knowledge management facilitate collaboration between different departments and teams within an organization [18]. By sharing knowledge across departments and teams, organizations can improve cross-functional communication and collaboration, leading to more innovative products [19]. Overall,

knowledge management can help organizations improve their product innovation capabilities by facilitating idea generation, accelerating time-to-market, increasing productivity, enhancing collaboration, and improving the product quality. By leveraging knowledge management to support product innovation, organizations can differentiate themselves from competitors, attract new customers, and drive revenue growth. Therefore, we hyphothesized that

H1: There is a positive and significant relationship between knowledge management and innovation capacity in the R&D departments of companies producing white goods.

H2: There is a positive and significant relationship between innovation capacity and product innovation performance in the R&D departments of companies producing white goods.

H3: Firm innovation capacity mediates the relationship between knowledge management and product innovation performance in the R&D departments of companies producing white goods.

In the next hyphotheses, we predicted that knowledge management enrich the business absorptive capacity, which in turn improves firm's product innovation performance. As we know, knowledge management involves the creation, dissemination, and application of knowledge within an organization (internal knowledge), whereas absorptive capacity refers to a firm's ability to acquire, assimilate, and apply external knowledge. Knowledge management plays a critical role in enhancing a firm's absorptive capacity by providing the necessary infrastructure, processes, and systems to manage and leverage knowledge effectively. For instance, a firm that has a robust knowledge management system can more effectively capture, store, and share knowledge across different departments and teams, making it easier to identify and utilize external knowledge [49].

Knowledge management enable a firm to develop its internal knowledge base and enrich its internal knowledge database, which can enhance its absorptive capacity by making it easier to capture, assimilate and apply external knowledge [48]. In the middle or long term, a business with a well-developed knowledge management system is in better strategic position to combine internal and external knowledge to create new and innovative products, services, and processes.

A firm that has a high absorptive capacity can more effectively identify external knowledge about customers, market, competitors, and trends. It is expected that product innovation performance can be affected by firm's absorptive capacity. When a firm has a high absorptive capacity among its competitors, it can more effectively explore, identify, and exploit external sources of knowledge, such as changes in customer's needs, notice quicker emerging market trends, and collect customers' feedback [47]. This, in turn, can help the firm develop new and innovative products that meet market needs and outperform competitors. On the other hand, a firm with low absorptive capacity may struggle to identify and assimilate external knowledge, resulting in a limited ability to develop new and innovative products. Therefore, a firm's absorptive capacity is a critical factor in determining its ability to innovate and compete in the marketplace [9]. Considering all together, we predicted that

H4: There is a positive and significant relationship between knowledge management and absorptive capacity in the R&D departments of companies producing white goods.

H5: There is a positive and significant relationship between absorptive capacity and product innovation performance in the R&D departments of companies producing white goods.

H6: Firm absorptive capacity mediates the relationship between knowledge management and product innovation performance in the R&D departments of companies producing white goods.

3. Methodology

While conducting the survey, random sampling method was applied, and a survey was sent to 802 employees who could reach their e-mail addresses in the R&D departments of white goods manufacturing companies. It is aimed to prevent the common method variance problem by keeping the number of explanations and questions on a low scale. Since the survey was answered on the online link, anonymity was provided for the participants. All questions are loaded with mandatory categories so that there is no missing markup in the survey. A total of 403 (79.4%) in the survey at the end of the specified period were male, 104 (21.6%) including female employees responded from 507 employees. A total of 338 participants (66.7%) were 28–40 age group and 169 participants (33.3%) in the 41–50 age group. All employees who answered the survey have a bachelor's degree. A total of 18 employees continue their master's education with formal or distance education and master's (without thesis) and 3 employees continue their Ph.D. education. Demographic characteristics can affect the answers, so it can create problems in treating the data. To

avoid this problem, it was analyzed whether there was a difference between the average score given to the scale questions in the second group according to demographic characteristics. The scale of the study is divided into two groups: demographic questions and 4-D questions representing the model that constitutes the subject of analysis. Resources that are used to use scales that represent variables; the knowledge management scale was used by [50]. The scale of innovation capacity [51] and [22], and the absorptive capacity scale was used by [52] and [53]. The product innovation performance scale was used in [54] and [55]. Figure 1 present the research of the study.

The model represents direct effects for hypotheses H1, H2, H4, and H5, while H3 and H6 represent mediator effects. The independent variable for hypotheses H1, H4, H3, and H6 is the KM variable. The IC variable is the independent variable in the H2 hypothesis and the mediator variable in the H3 hypothesis. The ac variable is the independent variable in the H5 hypothesis and the mediator variable in the H6 hypothesis. The dependent variable for the H2, H3, H5, and H6 hypotheses is the PIP variable. Regression equations have been established for hypotheses H1, H2, H4, and H5, and the coefficients have been checked for meaningfulness using tests. Mediator effect analyses for hypotheses H3 and H6 were conducted using the Hayes Process V3 plug-in, and the results were presented in tables.

4. Analysis

Since only two categories were marked in the gender and age variables, an average comparison test was performed using the Independent Samples *t*-test. The obtained result was Sig (0.000 $<$0.05) for Age and Sig (0.000 $<$0.05) for gender, indicating that there is no difference between the average scores given to the scale questions in the second group based on gender or age. Answers were collected in three categories in the training variable, and a one way anova test was conducted between the averages. It was found as Sig (0.000 $<$0.05), and again, there was no difference between the mean scores given to the second group according to the educational status. These results showed that there was no problem with the data, and data analysis continued after this stage.

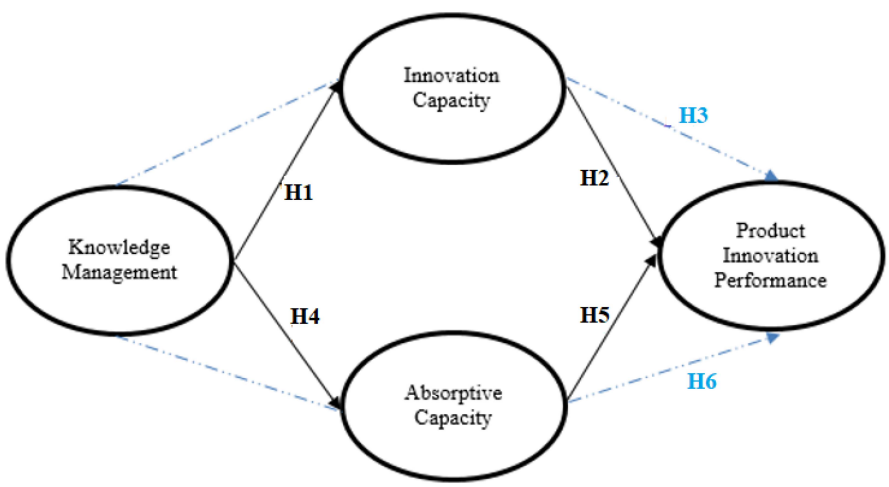

Figure 1. Research model.

In the measurement of many occurrences or cases, verbal expressions, i.e., observable indicators, are referenced. Factor analysis takes these observable indicators and groups them according to the dimensions that they measure, and the groups obtained are called "Factors." The main function of factor analysis is the creation of these factors, and the correlations between expressions/substances are applied in this factorization [56]. The measuring tool created aims to measure four dimensions (KM, IC, AC, PIP), and therefore, the scale must produce four factors because of factoring. At the same time, factors should have a relationship between themselves and their expressions have appropriate factor loads. Confirmatory factor analysis (CFA) was performed to see if the intended situation occurred. First, it was checked whether the dataset is in line with factor analysis, and the CFA results were shown in Table 7 in the Appendix.

To achieve valid and reliable results from factor analysis, the test results of Bartlett's globality test [57] and Kaiser–Meyer–Olkin (KMO) should be considered [58]. According to the Kaiser test, the KMO result should be above 0.60, and the Bartlett test result should be significant (Sig. $<$0.05).

According to the test results in Table 1, KMO test value is 0.954 and Bartlett Test of Sphericity Sig. (0.000 $<$0.05), it is suitable for data factor analysis. The results of confirmatory factor analysis can be found in Appendix 1.

Factor loads indicate the interaction results of expression and factors. When determining the expressions, factor loads of more than 0.60 were taken and expressions with lower factor loads were removed from the scale. *T* score values indicate whether the relationship between expression and factors is meaningful. Since all *t*-score values are greater

than the critical value of 1.96 determined at the 0.05 level of significance, the relationship between expression and factors is significant. At the same time, the relationships are meaningful because all *p* value values are less than 0.05. Table 2. Goodness of fit indices of the model.

The ratio of chi-square and degrees of freedom values (1940.28/458 = 4.24) shows a good fit in the range of 2 to 5 with reference values. RMSEA value (0.067) less than 0.08, RMR value (0.041) less than 0.05, NFI value (0.96) greater than 0.95, NNFI value (0.97) greater than 0.95, CFI value (0.97) greater than 0.95, and the RFI value (0.96) close to 1 is a good fit indicator. The fact that the GFI value (0.86) is greater than 0.85 is a good compliance value compared to all these indicators, the model fits well.

Other analyses were passed because the values of the favor of harmony also showed that the model fits well. The IC, KM, AC, and PIP variables were created by taking the emoticons (see Table 3). The descriptive statistical values of these variables are given to each other, the correlation of variables with each other, the Cronbach Alpha reliability coefficients of variables, and the average variance extracted (AVE), compliance, validity, and composite reliability (CR) values. AVE values are requested to be greater than 0.50 [60] and CR values greater than 0.80 [61]. To ensure validity, all CR values for the scale must be greater than the AVE values. When the table is examined, all AVE values are above 0.50, all CR values are above 0.80, and all CR values are greater than their AVE values.

Table 1. KMO and Bartlett Test Results.

Kaiser–Meyer–Olkin Measure of Sampling Adequacy		0.954
Bartlett's Test of Sphericity	Approx. Chi-Square	12219.496
	Degrees of Freedom	496
	Sig.	0.000

Table 2. Goodness Fit Index Value and Reference Ranges.

Goodness of Fit Statistics	Value	Referans Değerleri
Chi-Square (χ^2)	1940.28	$2<(\chi^2)/Df<5$ good fit
Degrees of Freedom	458	
Root Mean Square Error of Approximation (RMSEA)	0.067	RMSEA<0.05 perfect fit RMSEA<0.08 good fit 0.08 = <RMSEA<0.10 mediocre fit 0.10 = >RMSEA poor fit
Root Mean Square Residual (RMR)	0.041	RMR<0.05
Normed Fit Index (NFI)	0.96	NFI>0.95 good fit
Non-Normed Fit Index (NNFI)	0.97	NNFI>0.95 good fit
Comparative Fit Index (CFI)	0.97	CFI>0.95 good fit
Relative Fit İndex (RFI)	0.96	0<RFI<1 Close to 1 better fit
Goodness of Fit Index (GFI)	0.86	GFI>0.85 good git

*Adapted from [59].

Table 3. Descriptive Statistics, Correlations, and Reliability Statistics.

					Correlations					
Factor	N	KMO	Mean	S.D.	IC	KM	AC	PIP	AVE	CR
IC	12	0.955*	3.97	0.81	[0.952]				0.63	0.95
KM	9	0.921*	4.27	0.63	0.542**	[0.907]			0.57	0.92
AC	7	0.900*	4.01	0.68	0.570**	0.673**	[0.890]		0.55	0.89
PIP	4	0.825*	4.22	0.68	0.502**	0.714**	0.630**	[0.879]	0.65	0.88

* Bartlett test' Sig<0.05** Correlation is significant at the 0.01 level; the expressions in square brackets are the Cronbach Alpha values of the factors.

Regression analysis results for the hypothesis of the year have been given in Table 4. Simply linear regression was performed because a dependent argument was used. For H1, H2, H4, and H5 hypotheses, Sig. Both F value values show that the models are significant, and hypotheses are supported. H1, H2, H4, and H5 hypotheses were accepted, and all independent variables had a positive effect on dependent variables. The H3 and H6 hypotheses have been established regarding whether IC and AC variables have a mediation effects. The results obtained for H3 are given in Table 5.

In Table 5, mediator effect analyses were carried out with an intermediary test developed by [62]. There are no P values for mediator effect analysis in this test. The mediator effect is interpreted based on the BootLLCI and BootULCI values. If there is no zero value between BootLLCI and BootULCI values mentioned in the model, the mediator effect is mentioned in the relationship. There is no zero number between BootLLCI (0.0466) and BootULCI (0.1349) values under the line "Completely standardized indirect effect (s) of KM on PIP" in the table. For this reason, H3 was accepted, and IC was accepted as the mediator variable in the relationship between KM and PIP. At the same time, the table has been given the direct effect of km on IC, the direct effect of KM and IC on PIP at the same time, and the direct impact of km on PIP. When all mentioned effects are examined in the table, the presence of direct effects can be seen. The results obtained for H6 are given in Table 6.

There is no zero number between BootLLCI (0.1258) and BootULCI (0.2414) values under the line "Completely standardized indirect effect (s) of KM on PIP" in Table 7. For this reason, H6 was accepted, and AC was accepted as the mediator variable

in the relationship between KM and PIP. At the same time, the table has been given the direct effect of km on IC, the direct effect of KM and IC on PIP at the same time, and the direct impact of km on PIP. When all mentioned effects are examined in the table, the presence of direct effects can be seen.

5. Discussion

The reason knowledge is considered a valuable production factor for enterprises is that the knowledge collected in a competitive environment is converted into strategies and applied within the organization. Businesses that have knowledge and make it a strategic resource

Table 4. H1, H2, H4, and H5 Hypothesis Results.

H	Independent Variables	Dependent Variables	Std. β	Sig.	Adjusted R Square	F Value	Reject/Accept
H1	KM	IC	0.542	0.000	0.293	210.236	**Accept**
H2	IC	PIP	0.502	0.000	0.250	169.830	**Accept**
H4	KM	AC	0.673	0.000	0.452	418.045	**Accept**
H5	AC	PIP	0.630	0.000	0.395	331.748	**Accept**

Table 5. Mediator Effect Results for H3 Hypothesis.

Outcome Variable: IC							
	coeff	se	t	p	LLCI	ULCI	S.coef
Constant	0.9821	0.2080	4.7219	0.000	0.5735	1.3907	
KM	0.6982	0.0482	14.4995	0.000	0.6036	0.7928	0.5422
Outcome Variable: PIP							
	coeff	se	t	p	LLCI	ULCI	S.coef
Constant	0.7797	0.1463	5.3312	0.000	0.4924	1.0670	
KM	0.6777	0.0394	17.1852	0.000	0.6002	0.7552	0.6258
IC	0.1366	0.0306	4.4596	0.000	0.0764	0.1967	0.1624
Outcome Variable: PIP Total Effect Model							
	coeff	se	t	p	LLCI	ULCI	S.coef
Constant	0.9138	0.1458	6.2685	0.000	0.6274	1.2002	
KM	0.7730	0.0338	22.9049	0.000	0.7067	0.8394	0.7138
Completely standardized indirect effect(s) of KM on PIP							
	Effect	BootSE	BootLLCI	BootULCI	**H3: Accept**		
IC	0.0880	0.0222	0.0466	0.1349			

Table 6. Mediator Effect Results for H6 Hypothesis.

Outcome Variable: AC							
	coeff	se	t	p	LLCI	ULCI	S.coef
Constant	0.8816	0.1548	5.6945	0.000	0.5774	1.1857	
KM	0.7328	0.0358	20.4462	0.000	0.6624	0.8032	0.6730
Outcome Variable: PIP							
	coeff	se	t	p	LLCI	ULCI	S.coef
Constant	0.6746	0.1442	4.6798	0.000	0.3914	0.9578	
KM	0.5742	0.0437	13.1282	0.000	0.4883	0.6601	0.5302
AC	0.2714	0.0402	6.7562	0.000	0.1925	0.3503	0.2729
Outcome Variable: PIP "Total Effect Model"							
	coeff	se	t	p	LLCI	ULCI	S.coef
Constant	0.9138	0.1458	6.2685	0.000	0.6274	1.2002	
KM	0.7730	0.0338	22.9049	0.000	0.7067	0.8394	0.7138
Completely standardized indirect effect(s) of KM on PIP							
	Effect	BootSE	BootLLCI	BootULCI	**H6: Accept**		
AC	0.1836	0.0294	0.1258	0.2414			

have easier access to their goals. Businesses should harmonize their internal dynamics with everchanging and evolving environmental factors. For this, they need the knowledge they obtain from internal and external sources. The knowledge management process has a long-term strategic perspective and concerns the entire organization. The knowledge analysis, selection, and application should be implemented in the knowledge management process.

Knowledge allows businesses to analyze potential opportunities and threats concerning their present and future. It is all kinds of talent and organizational competence that make a business different from its competitors. Businesses that integrate these competencies with knowledge systems, which are difficult to imitate, have an upper hand on their competitors. The development of the innovation capacity of companies depends on the performance-enhancing activities of the management tier in the company. Among these activities, companies should regularly inform employees with the most up-to-date training to produce better quality, while at the same time, they should closely follow technology and develop their ability to innovate. Having an organization that can adapt quickly to change accelerates the process of developing innovation capacity [63]. One reason why companies need to develop innovation skills is that they are looking for new opportunities in the field of trade.

The innovation capacity that companies design contributes to the growth of service areas. The development and creation of innovation capacity contribute to leading competitors in quality service presentation [64]. Since companies want to increase demand in customer relations, they try to implement the continuity of these demands by demonstrating their innovation capacity. The innovation models offered may vary, and competing companies contribute to the financial value of the companies. It can be explained that the assimilated capacity has a positive effect when companies can use the knowledge they obtain correctly. In particular, research results show that the assimilated capacity has a positive effect on product innovation performance. At the same time, it is likely that the assumed capacity is supported by knowledge management and will reflect positively on the production outputs. Looking at the research results, the mediation effects of innovation capacity and assimilated capacity are positive. However, for companies to be successful in innovation capacity and assimilated capacity, they must have sufficient infrastructure and R&D activities. Since the research is done in large companies producing white goods, it is not possible to say that the research results are true for each company level. In addition, conducting such research in companies in the manufacturing sector and without R&D departments would be better for comparative analysis. At the same time, it is useful to pay attention to the size of the companies and the infrastructure they have when examining the impact of knowledge management on the types of innovation.

6. Conclusion

Innovation capability describes it as a way of implementing new ideas that affect the attitudes of companies that want to innovate, but also aims to promote new ideas and develop a new think tank [65]. Companies capable of innovation must be able to constantly convert their knowledge and ideas into new products, processes, and systems for the benefit of stakeholders [23]. Therefore, if knowledge management has a positive impact on innovation capacity, it will be possible to meet customers' wishes and needs by developing special designs, methods, and creative ideas. In the process of rapidly developing technology, if companies use knowledge-based resources correctly, it can be produced by a better understanding of the wishes of customers. The emergence of innovation capacity is achieved by companies investing in R&D Centers that can reveal these capabilities [66]. Companies that need manufacturing, manufactured, organizational unity, and skilled workforce are trying to create innovation capacity in research and development centers. Continuous innovation of technology increases customer needs. To meet these needs, it can deliver the innovation capacity of companies with performance in generating.

The fact that companies have equipped knowledge of the management level and educate their employees within this information accelerates the creation of innovation capacity [67]. Looking at the impact of assimilated capacity, companies need to invest in R&D and strengthen assimilated capacity in order to prepare for future development [34]. In the literature, assimilation capacity is evaluated from different perspectives and assimilation capacity; it is stated that it is associated with concepts such as knowledge management systems, strategic alliances, and information transfer within the organization [68]. Accordingly, the research model examined the relationships between knowledge management and product innovation performance variables in both independent and mediation influence of assimilated capacity. As a result of the analysis, it can be argued that if the capacity

of assimilating is successful, it is also positively affecting the product innovation performance. Since it is stated that the capacity of assimilating may vary depending on the environmental factors trying to obtain knowledge [69], it can be emphasized how important it is to obtain knowledge correctly and understandably. At the same time, the assimilated capacity may vary according to the size of the companies and the sectoral environment in which they are located. However, if an innovation-oriented manufacturing activity has been adopted, in this case, companies must succeed in assimilating capacity [70], [71], [72].

7. Implications for Research and Practice

This research from Turkey offers some managerial implications. It is well accepted that, knowledge management is critical for different types of businesses that want to remain competitive, improve decision-making within the company, enhance collaboration among workers, and provide excellent customer services [73]. The direct and indirect impact of knowledge management on firm innovation particularly important message for business managers who aimed to invest heavily on R&D projects [74]. By capturing and facilitating knowledge sharing across different business departments, enhancing collaboration, and continuous improvement, knowledge management can help R&D teams to achieve their goals and deliver innovative solutions [75]. Furthermore, our finding reveals that knowledge management can help to foster a culture of innovation within the different organizational teams. By capturing and sharing knowledge and ideas, team members can build on each other's work and come up with new and innovative solutions [76].

It is advised that the business managers pay attention to importance of their business absorptive capacity. We argue that firms endowed with more absorptive capacity are in better position to identify the presence of important external knowledge flows and, more importantly, exploit them efficiently and end up with innovative ideas. By leveraging external knowledge and expertise, businesses can reduce the time and resources required to develop new ideas, products, and services. By using external networks to acquire external knowledge and enriching absorptive capacity, businesses can access new ideas and solutions, and speed up the innovation process [77], [78]. This can give them a competitive advantage by allowing them to bring new products to market faster than their competitors.

On the other hand, knowledge management can have a significant impact on an organization's absorptive capacity. By enabling knowledge sharing, acquisition, assimilation, transformation, and exploitation, knowledge management can improve the organization's ability to acquire, assimilate, transform, and exploit new knowledge from its external environment. It is worth to know that product innovation is driven by customer needs and demands. Businesses must identify customer needs and preferences to develop products that meet those needs and create value for the customer. By enriching absorptive capacity within the companies, they will be able to gather external information on customer needs, store the data, analysis it, and find out the about emerging market trends, and competitor offerings. Therefore, the companies will be in better position to develop new or improved products that meet customer needs and create value. In this way, the businesses can differentiate themselves from competitors, attract new customers, and drive revenue growth.

8. Limitations of the Study

There are some limitations with this research. Since surveys are collected and analyzed from white-collar companies working in manufacturing companies, using this single source of data may put in risk the generalizability of the finding to other sectors. At the same time, research results may vary in companies within different cultural structures. Therefore, comparative analysis in future studies will be more important in terms of contributing to the theory. At the same time, there are important ventures in technology-oriented initiatives, especially in areas such as artificial intelligence and big data. Research in such areas will enrich the literature. With the rapid change and development of technology, a rapid transition to industry 5.0 is taking place. For this reason, it is very important to examine the variables that represent the research model on the basis of industry 5.0 and to bring new concepts to the literature. Moreover, a suggestion for future studies may be quite interesting, with the results of the work on blue collars. Therefore, it may be considered that such research should be done on blue collars. The considerations that companies in the production sector should consider in the research results are to ensure success in knowledge management, the second condition is to develop innovation capacity, and in the third condition, the capacity of assimilated is successfully managed.

APPENDIX 1: MEASUREMENT ITEMS AND CFA RESULTS

Table 7. Confirmatory Factor Analysis Result.

	Standardized Model Results		
	Factor Loading	T Score	P
IC1. The company I work with cares about innovative and creative abilities when recruiting staff.	0.71	17.55	0.000
IC2. The new production process or processing procedure used in the company I work for is imitated by its competitors.	0.73	18.73	0.000
IC3. The company I work with has better R&D capability than its competitors in terms of new products/services.	0.72	18.42	0.000
IC4. The company I work with is always developing new capabilities to transform old products into new ones.	0.77	20.53	0.000
IC5. New products/services developed by the company I work with are always imitated by rival companies.	0.77	20.43	0.000
IC6. Performance assessment management provides reliable knowledge on how far it achieves effective goals.	0.80	21.67	0.000
IC7. The company I work for develops new products/services, which are often easily accepted by the market.	0.86	24.04	0.000
IC8. The majority of the profits of the company I work for derive from the new products/services developed.	0.83	22.78	0.000
IC9. The company I work for often launches new products/services faster than its competitors.	0.80	21.59	0.000
IC10. In line with the marketing needs in the company I, work with, the department can make a change of the business department.	0.84	23.20	0.000
IC11. Department managers of company work to implement new leadership approaches that will direct all staff to complete their mission.	0.81	21.80	0.000
IC12. In the company I work with motivation is provided by human resources practices that will increase the well-being of the staff.	0.83	22.68	0.000
KM1. In the company I work with, the knowledge obtained is recorded and stored for reapplication in the future.	0.79	21.07	0.000
KM2. We attend courses, seminars, or similar training for skills development in the company I work for.	0.78	20.45	0.000
KM3. Continuous evaluations are made on how the knowledge obtained in the company I work can be better used.	0.83	22.51	0.000
KM4. Opportunities to provide new services/products to customers in the company I work for are quickly noticed and understood	0.68	14.01	0.000
KM5. Has well-organized documents on the knowledge and achievements of the employees in the company I work for.	0.69	14.31	0.000
KM6. We hire consultants when important skills/expertise or knowledge related to any activity are not available at our company.	0.81	21.84	0.000
KM7. Problems related to processes are openly discussed in the company I work for.	0.75	19.28	0.000
KM8. In the company where I work, brainstorming sessions are frequently held between employees and senior management to solve problems.	0.75	19.38	0.000
KM9. In the company I work with, changing market demands are quickly perceived, analyzed, and understood.	0.70	17.76	0.000
AC1. In the company I work with, other departments are consulted on ideas and concepts.	0.72	18.23	0.000
AC2. In the company I work with, regular meetings between departments are held to exchange views on new developments, problems, and achievements.	0.70	16.36	0.000
AC3. In the company I work with, employees are capable of using the collected knowledge by adapting them to company activities.	0.81	21.36	0.000
AC4. In the company I work with, employees can apply new knowledge in product design studies.	0.75	19.03	0.000
AC5. The company I work with, has the ability to work more efficiently if adapted to new technologies related to product design.	0.74	18.73	0.000
AC6. Employees in the company I work with, can successfully reconcile existing knowledge with new insights.	0.71	17.69	0.000
AC7. If a department obtains important knowledge, this knowledge is delivered quickly to all units and departments in our company.	0.75	19.26	0.000
PIP1. New features are added to the products produced in the company I work for and are constantly being developed.	0.76	19.67	0.000
PIP2. The company I work with, has a new product model with ease of use.	0.87	24.06	0.000
PIP3. New studies are being carried out to offer the products available in the company where I work on new markets.	0.79	20.75	0.000
PIP4. The company I work with, has the ability to develop an industry product and market it as a new product.	0.80	21.06	0.000

KM: Knowledge Management, IC: Innovation Capacity, AC: Absorptive Capacity, PIP: Product Innovation Performance.

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