


KNOWLEDGE MANAGEMENT AS A NEW STRATEGY OF INNOVATIVE DEVELOPMENT

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ARTICLE INFO	ABSTRACT
<p>Article history:</p> <p>Received 31 January 2023</p> <p>Accepted 28 April 2023</p>	<p>Theoretical framework: The relevance of studying the growing role of knowledge management in the context of ensuring the innovative activity of enterprises is increasing. The results demonstrate a number of important conclusions that have made it possible to expand the existing theoretical and practical aspects of the knowledge management concept.</p>
<p>Keywords:</p> <p>Economy; Improvement; Implementation; Migration; Welfare; China; Kyrgyzstan; Ukraine.</p>	<p>Design/methodology/approach: The conducted study in service companies has revealed a low culture of using this concept in the Ukrainian context. In the course of the research, it has been established similar and different features of the influence of knowledge management on innovation of service companies, direct and indirect relationship between variables, complex structure and indirect impact of production, integration, application of information on the speed, quality and number of innovations in enterprises.</p>
	<p>Findings: The complex structure of the relationship between knowledge and innovative activity can be a consequence of insufficient level of personnel competencies, available information and data management technologies, methods and practices of production, integration and application. Therefore, the low innovativeness of the service companies under study in the context of system orientation and technological capabilities of the companies, in particular, in the practice of knowledge management, and the low impact of knowledge and information on the innovation of services and processes on the market of Ukraine have been revealed.</p>
	<p>Research, Practical & Social implications: This is precisely why the strategy of personalization significantly prevails in its use in knowledge management compared to the codification strategy, which is manifested in the limited practice of using systems and technologies for the generation, accumulation, storage, use, dissemination of knowledge.</p>
	<p>Originality/value: In addition, the use of the personalization strategy is explained by the fact that the service companies under consideration focus more on processes, the optimization of which significantly affects interaction with customers and the efficiency of operations.</p>
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GESTÃO DO CONHECIMENTO COMO UMA NOVA ESTRATÉGIA DE DESENVOLVIMENTO INOVADOR

Estrutura teórica: A relevância de estudar o papel crescente da gestão do conhecimento no contexto de garantir a atividade inovadora das empresas está aumentando. Os resultados demonstram uma série de conclusões importantes que possibilitaram a expansão dos aspectos teóricos e práticos existentes do conceito de gestão do conhecimento.

Projeto/metodologia/abordagem: O estudo realizado em empresas de serviços revelou uma baixa cultura de uso desse conceito no contexto ucraniano. No decorrer da pesquisa, foram estabelecidas características semelhantes e diferentes da influência da gestão do conhecimento sobre a inovação das empresas de serviços, a relação direta e indireta entre as variáveis, a estrutura complexa e o impacto indireto da produção, da integração e da aplicação de informações sobre a velocidade, a qualidade e o número de inovações nas empresas.

Conclusões: A estrutura complexa da relação entre conhecimento e atividade inovadora pode ser uma consequência do nível insuficiente de competências do pessoal, das tecnologias de gerenciamento de dados e informações disponíveis, dos métodos e práticas de produção, integração e aplicação. Portanto, a baixa capacidade de inovação das empresas de serviços em estudo no contexto da orientação do sistema e das capacidades tecnológicas das empresas, em particular, na prática da gestão do conhecimento, e o baixo impacto do conhecimento e das informações na inovação de serviços e processos no mercado da Ucrânia foram revelados.

Implicações sociais, práticas e de pesquisa: É exatamente por isso que a estratégia de personalização prevalece significativamente em seu uso na gestão do conhecimento em comparação com a estratégia de codificação, que se manifesta na prática limitada do uso de sistemas e tecnologias para a geração, acumulação, armazenamento, uso e disseminação do conhecimento.

Originalidade/valor: Além disso, o uso da estratégia de personalização é explicado pelo fato de as empresas de serviços em questão se concentrarem mais nos processos, cuja otimização afeta significativamente a interação com os clientes e a eficiência das operações.

Palavras-chave: Gestão do Conhecimento, Inovação, Desenvolvimento Inovador, Estratégia de Personalização, Estratégia de Codificação.

LA GESTIÓN DEL CONOCIMIENTO COMO NUEVA ESTRATEGIA DE DESARROLLO INNOVADOR

Marco teórico: La pertinencia de estudiar el papel creciente de la gestión del conocimiento en el contexto de la garantía de la actividad innovadora de las empresas es cada vez mayor. Los resultados muestran una serie de conclusiones importantes que han permitido ampliar los aspectos teóricos y prácticos existentes sobre el concepto de gestión del conocimiento.

Diseño/metodología/enfoque: El estudio realizado en empresas de servicios ha revelado una escasa cultura de uso de este concepto en el contexto ucraniano. En el transcurso de la investigación, se han establecido características similares y diferentes de la influencia de la gestión del conocimiento en la innovación de las empresas de servicios, la relación directa e indirecta entre variables, la estructura compleja y el impacto indirecto de la producción, la integración, la aplicación de la información en la velocidad, la calidad y el número de innovaciones en las empresas.

Conclusiones: La estructura compleja de la relación entre el conocimiento y la actividad innovadora puede ser consecuencia de un nivel insuficiente de competencias del personal, de las tecnologías disponibles de gestión de la información y los datos, y de los métodos y prácticas de producción, integración y aplicación. Por lo tanto, se ha puesto de manifiesto la escasa capacidad innovadora de las empresas de servicios objeto de estudio en el contexto de la orientación al sistema y las capacidades tecnológicas de las empresas, en particular, en la práctica de la gestión del conocimiento, y el escaso impacto del conocimiento y la información en la innovación de los servicios y procesos en el mercado de Ucrania.

Investigación, implicaciones prácticas y sociales: La estrategia de personalización prevalece significativamente en su uso en la gestión del conocimiento en comparación con la estrategia de codificación, que se manifiesta en la práctica limitada de la utilización de sistemas y tecnologías para la generación, acumulación, almacenamiento, uso, difusión del conocimiento.

Originalidad/valor: Además, el uso de la estrategia de personalización se explica por el hecho de que las empresas de servicios consideradas se centran más en los procesos, cuya optimización afecta significativamente a la interacción con los clientes y a la eficiencia de las operaciones.

Palabras clave: Gestión del Conocimiento, Innovación, Desarrollo Innovador, Estrategia de Personalización, Estrategia de Codificación.

INTRODUCTION

Successful companies are constantly searching for ways to maintain leading positions in the market, to ensure innovative activities of products, processes, services, etc. The combination of negative experience of managers and leaders has made it possible to understand the fundamental knowledge management mechanisms, which ensure the effectiveness of functioning and are often common strategies of economic activity. This concept began to develop in 1975, simultaneously with the active development of technologies that allow the accumulation of information and data, forming knowledge about most aspects of the enterprise. In order to ensure competitiveness, companies constantly create and maintain a balanced portfolio of intellectual capital. In the current competitive environment, organizations should prioritize and combine the goals of intellectual capital management, establish effective processes for obtaining knowledge in order to manage innovations. Taking into consideration that knowledge is the main driver of the “idea economy”, the “knowledge economy” (Wiig, 1997a), it can be expected that companies will increasingly focus on the creation of knowledge, its processing, development, organization and use in innovative activities. It is innovations that are extremely dependent on the availability of knowledge about the market, the products and services available on it (Du Plessis, 2007); therefore, the relevance of studying the growing role of knowledge management in the context of ensuring innovation is increasing.

LITERATURE REVIEW

The importance of knowledge development and knowledge management for ensuring competitiveness and innovation has been proven in the scientific literature (Carneiro, 2000). Knowledge is the process of transforming information and experience into a comprehensible set of relationships that can be used by an individual; at the same time, knowledge management is the process of identifying, collecting, organizing, and disseminating intellectual assets that are critical to organizational performance (Debowski, 2007). Successful process creation as an aspect of company management is essential to continuously drive innovations. Knowledge management strategies are necessary for continuous innovation activities. Knowledge management is comprehended in a broad sense as a process of general changes in the organization, focused on innovation, which is associated with the participation of each employee in the processes of creating and transferring knowledge (Forcadell & Guadamillas, 2002). Knowledge management is often defined as a factor of innovative activity or a prerequisite for innovation (Darroch & McNaughton, 2002). The literature review conducted

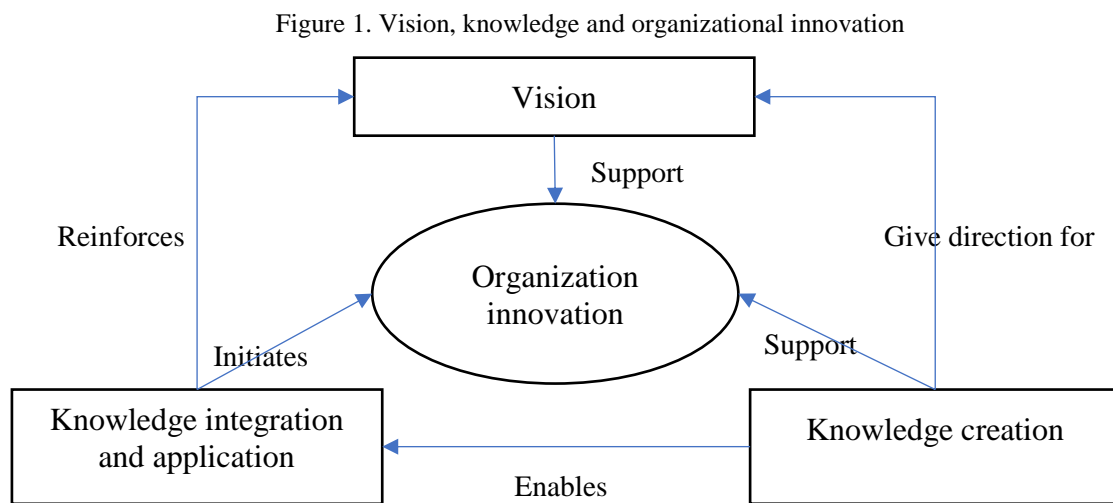
by Areed, Salloum & Shaalan (2021) proves that multiple knowledge management processes play a significant role in an innovative organization, influencing all types of innovation, and the exchange of knowledge is the most important process for innovations.

Wiig (1997b), in his scientific work, has explored the history of the knowledge management concept from its evolution in the early / mid 1980s to the late 1990s. Wiig (1997b) examines the agrarian economy, the natural resource economy, the industrial, product and information revolutions, and the knowledge revolution, highlighting the role assigned to the knowledge concept at each stage of development. In particular, the revolution of knowledge has meant the importance of knowledge assets for the success of organizations, prompting them to develop strategies for managing these assets (Wiig, 1997b). In particular, from among the strategies, the following are highlighted, namely:

1. Knowledge strategy as a focus of business strategy: emphasis on the creation, accumulation, organization, updating, exchange and use of knowledge in all plans, operations and detailed actions for its availability and use in every business transaction.
2. Focus of intellectual asset management strategy: emphasis on the management of specific intellectual assets at the enterprise level, such as patents, technologies, operational and management practices, customer relationships, organizational activities, and other structural knowledge assets. Management can focus on updating, organizing, evaluating, maintaining, and increasing the availability and marketing of these assets.
3. Focus on accountability strategies for personal knowledge assets: emphasis on personal responsibility for knowledge-related investments, innovation and competitiveness, updating, effective use and availability for other knowledge assets within each employee's area of responsibility in order to be able to apply the most competitive knowledge for the work of the enterprise.
4. Focus on knowledge creation strategies: emphasis on organizational learning, basic and applied research and development, as well as motivating employees to innovate and accumulate experience in order to obtain new and better knowledge that will lead to increased competitiveness.
5. Focus on knowledge transfer strategies: emphasis on systematic approaches to transfer – acquiring, organizing, restructuring, storing or memorizing, repackaging for deployment and dissemination of knowledge to action points where it will be used to do work. It includes sharing of knowledge and implementation of best practices. In

practice, organizations use one or several strategies that are implemented in order to introduce innovative products, services, business processes (Wiig, 1997b).

Organizations use knowledge management strategies to ensure innovation; by the way, vision and mission are needed to better understand (Gupta, Iyer & Aronson, 2000) which knowledge management strategy should be applied (Figure 1). The formation and accumulation of knowledge is a prerequisite for their integration, use for the company’s goals, which are defined in accordance with the vision. At the same time, the accumulation of knowledge sets the direction for the company’s vision and development, thus supporting innovative activities.



Source: Johannessen, Olsen & Olaisen (1999).

In the scientific literature, system-oriented and human capital-oriented knowledge management strategies are also distinguished (Table 1), from among which the codification and personalization strategies are the most common.

Table 1. Knowledge management strategies classification

#	System-oriented	Human-oriented
1	Codification	Personalization
2	Exploitation	Exploration
3	Exploiters	Innovators Explorers
4	Explicit-oriented	Tacit-oriented
5	Conservative	Aggressive
6	Systems-oriented	Dynamic, human-oriented
7	Market	Community, Network-based;
8	Codification	Traditional Exploration
9	Copier, continuous improver	Socialization Skill acquirer, innovator

Source: López-Nicolás & Meroño-Cerdán (2011).

The codification strategy is constructed on technologies, systems and procedures to describe and codify an organization’s knowledge and experience, thus, transforming organizational knowledge from tacit form to explicit one. The purpose of this strategy lies in creating a repository of knowledge or databases within the particular organization, to which all employees have access in order to search and obtain the knowledge necessary for their work, without the need to contact the person responsible for creating knowledge, entering information. In contrast, the personalization strategy emphasizes interaction and the direct exchange of knowledge between individuals in the organization. According to this approach, knowledge is transferred through face-to-face conversations. This strategy is developed based on the creation of social networks in teams, and it is implemented through the processes of coaching or mentoring. The strategy focuses on the acquisition of internal knowledge and promotes the exchange of knowledge mainly through informal channels. In the scientific literature, the codification strategy is considered as a system-oriented strategy, while the personalization strategy is considered as a person-oriented strategy (Ngoc Thang & Anh Tuan, 2020).

Table 2. Codification and personalization KM strategies.

	Codification	Personalization
Economic motivation	Knowledge reuse	New solutions and knowledge development
Knowledge managed	Explicit	Tacit
Focus	Person-to documents	Person-to-person
Use of IT	Heavy IT investment: connecting people and reusable knowledge	Moderate IT investment: facilitating dialogue and tacit knowledge sharing
Main tool	Decision support systems Document repositories Knowledge maps Workflow Best practices databases	Mentoring Groups Videoconferencing Bellow pages E-mail Discussion forum
Human resources Management	E-learning Rewarding the use of and contribution to databases	Mentoring Rewarding knowledge sharing with others
Advantages	Economies of scale Time savings No need of reinventing the wheel Quicker and wider access and distribution of knowledge	Knowledge cataloguing is easy Flexible and adaptable knowledge Improvements in task quality Improvements in clients image Management of uncodifiable knowledge
Disadvantages	High cost Codified knowledge loses richness	Unwillingness to share Inappropriate culture

Source: Greiner, Böhmman & Krcmar (2007); López-Nicolás & Meroño-Cerdán (2011); Ngoc Thang & Anh Tuan (2020).

The development of the theory and the knowledge management concept has stimulated the empirical research to examine how various knowledge management strategies ensure the development and implementation of innovation in the company. Both knowledge management and the impact of the processes of obtaining, accumulating, and integrating knowledge into management processes significantly depend on the factors as follows: market functioning, scope of activities, knowledge management strategies. This is evidenced by a number of empirical studies. Numerous factors directly and indirectly determine the impact of knowledge management on innovative development. Therefore, the norms specific to the company and the market of its operation, knowledge development and innovation strategies are closely related; consequently, they can promote or hinder competitive advantages at the company level (Johannessen, 2008). Thus, the innovation process to a great extent depends on knowledge and knowledge management, intellectual assets and human capital, which should be an important element of running any type of business (Gloet & Terziowski, 2004).

Darroch & McNaughton (2002), based on the data of 443 New Zealand's firms, examine the prerequisites and consequences of effective knowledge management for the following types of innovation: 1) gradual innovation; 2) innovations related to changes in customer behaviour; 3) innovations that change competencies. The results of the study indicate the greatest importance of the processes of obtaining knowledge and timely response to them for the implementation of innovations, compared to the processes of spreading knowledge, which are less important (Darroch & McNaughton, 2002).

The study conducted by Nowacki & Bachnik (2016) examines four aspects of the performance of small, medium and large enterprises in Poland, namely: enterprise competitiveness, revenues, customer satisfaction and business partner satisfaction. The main conclusion made by the authors lies in the fact that the enterprises under consideration are not very innovative in the field of knowledge management.

Greiner, Böhmman & Krcmar (2007) have investigated the knowledge management practices of 11 German and Swiss companies based on the criteria as follows: goals, processes, problems, content, strategy, type of knowledge, assessing their compliance with the business strategy of the organizational unit. The authors conclude that there is an interrelationship between the success of knowledge management and the business strategy of organizations. The scientific work has revealed that organizations that have determined the efficiency of business processes as a goal should use the business strategy of codification. Along with this,

organizations the goal of which is product or process innovation should primarily use the personalization strategy (Greiner, Böhmman & Krcmar, 2007).

López-Nicolás & Meroño-Cerdán (2011) have investigated the impact of knowledge management (KM) strategies on innovation and company performance based on a study of 310 Spanish organizations. The authors have established that codification and personalization strategies affect innovation and organizational effectiveness directly and indirectly (through increased innovation capacity). In addition, the results show the different impact of strategies on different aspects of organizational performance (López-Nicolás & Meroño-Cerdán, 2011).

Lin, Che & Ting (2012) have studied the impact of market orientation, market knowledge and customer knowledge management on the performance of innovative product output from the perspective of dynamic capabilities of high-tech companies in Taiwan. The authors have found no significant influence of the company's market orientation on the efficiency of the production of innovative products. At the same time, important factors are knowledge of the market and management of knowledge about consumers, which mediate the relationship between market orientation and the effectiveness of innovative products (Lin, Che & Ting, 2012).

Santoro et al. (2018), on the basis of investigating 298 Italian firms, claim about the interrelationship between the knowledge management system, open innovation, knowledge management capacity and innovation capacity. The authors have revealed that the knowledge management system contributes to the creation of open and joint ecosystems, the use of internal and external flows of knowledge through the development of internal knowledge management potential, which, in turn, increases innovation potential (Santoro et al., 2018).

The study conducted by Mardani, Nikoosokhan, Moradi & Doustar (2018) shows similar conclusions based on data obtained from Iran 120 firms that are members of the Iranian Power Syndicate. In particular, knowledge management influences innovation and organizational effectiveness directly and indirectly through increased innovation potential. The processes of creating, integrating, and applying knowledge drive innovations and productivity. At the same time, knowledge creation has a more significant impact on innovation speed, quality and quantity, while innovation quality, knowledge creation and knowledge integration have a more significant impact on productivity (Mardani, Nikoosokhan, Moradi & Doustar, 2018).

Cabrillo & Dahms (2018) examine the moderating effect of strategic knowledge management (SKM) on the interrelationship between three components of intellectual capital

(IC) and firm innovation and market performance. Based on a survey of 101 Serbian companies, the authors have revealed that structural capital and relationship capital directly affect innovation efficiency. Despite the lack of a significant direct effect of human capital on innovation performance, a significant relationship with SKM has been found. The impact of human and structural capital on innovation performance is negatively mitigated by SKM; while SKM positively mitigates the impact of capital on innovation performance, but remains negligible (Cabrilo & Dahms, 2018). Soto-Acosta, Popa & Martinez-Conesa (2018), based on the study of data obtained from 429 Spanish SMEs, show that the ability to implement information technology, the ability to manage knowledge and environmental dynamism are positively related to innovations (Soto-Acosta, Popa & Martinez-Conesa, 2018).

The investigation conducted by Abbas & Sağsan (2019) examines the role of knowledge management in green innovation and corporate sustainable development (CSD) activities of small, medium and large manufacturing and service companies in Pakistan. The results demonstrate a significant impact of knowledge management on environmental innovation and CSD activities. By the way, green innovations also have a significant positive impact on CSD. With the exclusion of knowledge creation and acquisition, which indicate little influence on social sustainability, other governance variables have a significant impact on innovations for both manufacturing and service companies of any size (Abbas & Sağsan, 2019).

The conclusions of a survey of experts Oliva & Kotabe (2019) in Brazil on knowledge management barriers, practices, methods, tools show that start-ups with a higher level of innovation maturity, decision-making level and level of scalability development demonstrate a higher degree of using practices, methods and tools in knowledge management (Oliva & Kotabe, 2019).

The study of Ode & Ayavoo (2020) empirically examines the interconnection between knowledge management practices and firm innovation in the context of service firms in developing countries based on data from a sample of 293 service firms in Nigeria. Therefore, the practice of knowledge management contributes to the innovations of the firm, both directly and indirectly. The results indicate that the formation, storage and application of knowledge have a significant positive impact on innovations of the company. Knowledge application mediates the link between generation, dissemination, storage of information and innovation. Knowledge management practices promote innovation as a hierarchical structure, and linkage through knowledge application has the greatest impact on firm innovation (Ode & Ayavoo, 2020).

Based on a survey of 130 companies in Vietnam, Ngoc Thang & Anh Tuan (2020) have found a positive impact of knowledge acquisition on innovation. Moreover, the scholars have determined that the personalization strategy is more important than the codification strategy in terms of direct impact on innovation activity. At the same time, only the codification strategy reflects the relationship between knowledge acquisition and innovation. The results prove that the firm should optimally combine both strategies in order to achieve a high level of innovative results. In addition, for companies in the early stages of development or for companies in developing countries such as Vietnam, the knowledge acquisition and personalization strategy can provide innovative results (Ngoc Thang & Anh Tuan, 2020).

Hock-Doepgen et al. (2021), based on an empirical analysis of a sample of 197 small and medium-sized enterprises (SMEs), have revealed that external knowledge management capabilities stimulate the development of innovative business models, and the relationship is strengthened for firms with a high risk tolerance. Meanwhile, internal knowledge is effective only for companies with low risk tolerance (Hock-Doepgen et al., 2021).

METHODOLOGY

In the course of the research, the method of a structured survey of managers of enterprises' various departments in the service sector in Ukraine has been used, which are actively implementing the following innovations: products, services, business processes. The main criteria for the selection of enterprises were as follows: 1) activity on the market of Ukraine for more than 3 years; 2) the amount of income is more than 5 million UAH; 3) the availability of staff understanding of the concepts of knowledge management and innovation of products, services, and processes. As a result, 52 companies were selected according to the specified criteria, which agreed to involve personnel in conducting the survey. Taking into consideration the fact that the understanding of the concepts of knowledge management, innovation by the staff was important to ensure the reliability of the assessments, as a result, responses were collected mainly from marketing managers, sales managers, distribution managers (actively interacting with the marketing department), top managers managing different departments and possessing information about changes in companies.

The questionnaire of Mardani, Nikoosokhan, Moradi & Doustar (2018) has been adapted according to the Ukrainian market, which makes it possible to conduct the assessment (Appendix A):

A.1. Production of knowledge (k.pro)

A.2. Integration of Knowledge (k.int)

A.3. Application of Knowledge (k.app)

A.4. Innovation speed (i.spe)

A.5. Innovation quality (i.qua)

A.6. Innovation quantity (i.quan)

The questionnaire was adapted for Ukrainian enterprises. The questionnaire included additional questions about the types of innovations (products, services, processes) that were implemented by enterprises during last 12 months. A Likert scale was used to assess knowledge and innovation management in different companies, where 1 means “strongly disagree”, 7 – “strongly agree”.

RESULTS

The estimated average values of knowledge management indicate that the volumes of production, integration and use of knowledge are at a level above the average (scores 5,059; 5,07; 5,007), which, accordingly, should be reflected in innovations, the average scores of which are as follows: speed of innovations – 5,066, quality of innovation – 5,013; number of innovations – 4,954 (Table 3).

Table 3. Average values, standard deviation, minimum and maximum evaluations of knowledge and innovation management in service companies

	Average value	Standard deviation	Minimum	Maximum
A.1. Production of knowledge (k.pro)	5,059	0,349	4,162	5,892
A.2. Integration of Knowledge (k.int)	5,027	0,259	4,402	5,968
A.3. Application of Knowledge (k.app)	5,007	0,406	3,758	5,950
A.4. Innovation speed (i.spe)	5,066	0,503	3,647	6,076
A.5. Innovation quality (i.qua)	5,013	0,487	3,568	6,317
A.6. Innovation quantity (i.quan)	4,954	0,863	3,190	6,833

Source: it has been compiled by the author based on respondents’ answers.

We have also asked questions about the types of innovation used in order to determine which knowledge management strategies are in a greater degree used in service companies (personalization or codification). According to the respondents’ answers, personalization strategies prevail; however, codification is also significantly present in companies.

The assessment of the relationship between knowledge production and the speed, quality and quantity of innovations in service companies shows that there is no significant relationship between these variables (Table 4). Low correlation coefficients were found between assessments of the presence of personnel responsible for obtaining external knowledge from external sources and the following assessments related to innovation, namely: speed of introduction of new processes compared to key competitors (-0,115), speed of solving problems

compared to competitors (-0,243); offering new ideas (0,116), launching new products (0,103), developing new products (-0,152), improving processes (-0,157); a number of new or improved processes (-0,158). Thus, the formation of knowledge from external and internal sources negatively influences the speed of innovation, directly (new ideas, launch of new products) and indirectly (product development, improvement of processes); it affects the quality and quantity of innovations.

Table 4. Correlation matrix of the relationship between knowledge production scores (k.pro) and innovation

	<i>K.pro</i> 1	<i>K.pro</i> 2	<i>K.pro</i> 3	<i>K.pro</i> 4	<i>K.pro</i> 5	<i>K.pro</i> 6	<i>K.pro</i> 7	<i>K.pro</i> 8	<i>K.pro</i> 9	<i>K.pro</i> 0	<i>K.pro</i> 1
i.spe1	-0,064	-0,046	0,028	0,012	-0,053	0,053	0,039	-0,179	0,036	-0,017	0,037
i.spe2	0,199	0,040	0,046	-0,042	0,091	-0,120	-0,058	-0,092	-0,012	-0,059	-0,015
i.spe3	-0,040	0,183	0,077	-0,046	<u>0,158</u>	-0,027	-0,066	<u>0,148</u>	<u>0,177</u>	0,098	-0,014
i.spe4	<u>-0,115</u>	-0,048	<u>-0,271</u>	-0,005	-0,015	<u>0,169</u>	0,016	<u>-0,131</u>	0,010	<u>0,109</u>	0,036
i.spe5	<u>-0,243</u>	-0,069	0,001	-0,032	-0,029	-0,152	-0,011	0,029	0,067	0,024	0,117
I.qua1	<u>0,116</u>	0,103	0,013	0,104	0,137	0,057	0,096	-0,025	0,091	-0,025	0,007
I.qua2	<u>0,103</u>	-0,029	0,079	-0,043	-0,007	-0,028	-0,066	-0,020	<u>0,166</u>	0,037	0,027
I.qua3	<u>-0,152</u>	0,027	0,053	0,030	-0,030	-0,021	0,229	0,055	<u>-0,118</u>	0,000	0,077
I.qua4	<u>0,157</u>	0,069	0,106	0,045	-0,040	0,017	-0,214	0,043	-0,053	0,082	-0,098
I.qua5	0,042	0,030	<u>0,185</u>	-0,006	0,019	0,008	0,001	-0,024	<u>0,108</u>	0,036	-0,061
i.quan 1	-0,062	-0,077	<u>0,185</u>	-0,076	-0,015	0,015	0,032	-0,139	0,055	-0,107	0,096
i.quan 2	<u>-0,158</u>	0,039	-0,029	-0,023	0,082	0,080	-0,045	-0,064	-0,089	-0,088	0,080

Source: it has been compiled by the author

The assessment of the relationship between the integration of knowledge, in particular, knowledge storage, and the speed, quality and number of innovations in service companies indicates as follows: 1) a low direct and indirect relationship between the organization of knowledge and new ideas of companies (-0,124), the offer of new ideas compared to competitors (-0,188), the launch of new products (0,221), the number of new or improved products and services released to the market (0,127); 2) low inverse relationship between recording knowledge by electronic means at workplaces and improving management processes (-0,166); 3) a low connection between the retention of knowledge in the memory of employees and the speed of the spread of innovations (new ideas and product launches), quality (improvement of processes); 4) knowledge storage in personal reference files and knowledge speed (launch of products, implementation of new processes); 5) availability of knowledge in company procedures and speed, quality, number of innovations (development of new products, offer of new ideas, improvement of management, number of new or improved products,

services); 6) recording knowledge in the form of documents (such as office manuals, work practices, internal standards, lessons learned) and speed, quality, quantity of innovations; 7) understanding of the sources of knowledge search in case of necessity and the speed of innovation (implementation of processes); 8) understanding of persons who can provide information and the speed (implementation of processes), quality (improvement of management) of innovations.

Table 5. Correlation matrix of the relationship between knowledge integration scores (k.int1 – k.int10: storage) and innovations

	<i>K.int1</i>	<i>K.int2</i>	<i>K.int3</i>	<i>K.int4</i>	<i>K.int5</i>	<i>K.int6</i>	<i>K.int7</i>	<i>K.int8</i>	<i>K.int9</i>	<i>K.int10</i>
i.spe1	<u>-0,124</u>	-0,072	-0,067	0,005	-0,066	0,056	0,025	0,082	-0,043	-0,054
i.spe2	0,027	-0,077	<u>0,140</u>	<u>0,196</u>	0,047	<u>0,174</u>	0,092	-0,017	0,049	0,100
i.spe3	-0,071	0,035	<u>0,178</u>	0,076	<u>-0,118</u>	0,018	-0,059	0,051	-0,056	0,001
i.spe4	0,010	-0,090	0,024	<u>-0,137</u>	0,019	<u>-0,174</u>	0,038	-0,044	-0,013	-0,037
i.spe5	0,001	0,007	0,009	0,073	-0,067	<u>0,210</u>	0,011	0,025	<u>-0,152</u>	<u>0,115</u>
I.qua1	<u>-0,188</u>	0,008	-0,071	0,023	<u>0,102</u>	<u>0,112</u>	0,012	-0,094	0,007	-0,020
I.qua2	<u>0,221</u>	0,039	0,035	0,074	-0,030	0,070	0,093	0,015	-0,005	<u>0,130</u>
I.qua3	0,091	-0,051	-0,065	0,049	-0,023	-0,011	0,084	0,057	-0,100	0,021
I.qua4	0,073	-0,085	<u>-0,125</u>	-0,079	-0,095	-0,079	-0,046	-0,085	0,101	<u>-0,202</u>
I.qua5	0,056	<u>-0,166</u>	-0,014	0,005	<u>-0,156</u>	<u>-0,150</u>	-0,031	0,039	0,012	-0,079
i.quan1	<u>0,127</u>	0,066	-0,054	-0,001	<u>-0,162</u>	0,011	0,008	-0,037	0,049	-0,011
i.quan2	-0,050	-0,032	-0,053	0,003	-0,014	<u>0,200</u>	-0,016	0,005	-0,102	-0,108

Source: it has been compiled by the author

The assessment of the interrelationship between the integration of knowledge, in particular, knowledge distribution, and the speed, quality and number of innovations in service companies indicates as follows: 1) the principal variables of knowledge distribution that have a certain influence on the speed, quality, and quantity of innovations are the mentoring of less experienced personnel, the availability of knowledge to all employees due to the implementation of projects, the daily exchange of knowledge during interaction with colleagues at workplaces, personal transfer of knowledge, encouragement of management to transfer knowledge, productivity of knowledge exchange, availability of remote access to the database, availability of employees with specific knowledge to perform specific tasks. In general, the outlined indicators of the dissemination of knowledge affect as follows: 1) the speed of forming new ideas, the speed of launching new products, developing new products, implementing new processes, solving problems; 2) the quality of innovation (offering ideas to the market, launching products and ideas, developing new products, improving processes); 3) the number of new or improved products, services released to the market, or improved processes.

Table 6. Correlation matrix of the relationship between knowledge integration scores (k.int11 – k.int12: distribution) and innovations

	<i>K.int1</i> <i>1</i>	<i>K.int1</i> <i>2</i>	<i>K.int1</i> <i>3</i>	<i>K.int1</i> <i>4</i>	<i>K.int1</i> <i>5</i>	<i>K.int1</i> <i>6</i>	<i>K.int1</i> <i>7</i>	<i>K.int1</i> <i>8</i>	<i>K.int1</i> <i>9</i>	<i>K.int2</i> <i>0</i>	<i>K.int2</i> <i>1</i>
i.spe1	-0,041	-0,065	0,070	-0,020	-0,033	-0,007	-0,078	<u>0,134</u>	-0,070	<u>-0,110</u>	-0,012
i.spe2	<u>-0,119</u>	0,022	-0,053	0,076	<u>0,123</u>	0,082	0,099	0,038	0,002	0,050	<u>-0,185</u>
i.spe3	0,046	0,089	0,084	0,064	0,099	0,024	0,002	-0,019	0,048	<u>-0,164</u>	<u>-0,117</u>
i.spe4	0,063	-0,030	-0,032	-0,041	0,007	-0,068	0,015	-0,005	-0,079	-0,029	<u>0,144</u>
i.spe5	0,077	<u>0,114</u>	0,097	0,017	-0,098	-0,067	0,074	-0,020	0,031	-0,029	0,094
I.qua1	-0,092	0,079	0,022	0,047	0,032	0,051	-0,016	0,021	<u>0,110</u>	<u>-0,103</u>	-0,001
I.qua2	0,095	0,024	0,078	0,026	0,025	0,072	0,051	0,013	<u>0,136</u>	<u>0,207</u>	<u>-0,103</u>
I.qua3	-0,082	-0,023	-0,041	0,021	<u>-0,147</u>	<u>-0,106</u>	-0,068	0,071	-0,032	-0,042	0,030
I.qua4	<u>-0,204</u>	<u>0,131</u>	-0,041	-0,081	0,044	0,037	-0,089	-0,001	-0,045	-0,024	-0,092
I.qua5	-0,067	0,032	0,035	0,018	-0,034	0,058	0,013	-0,059	0,037	0,092	0,056
i.quan 1	<u>-0,121</u>	0,040	-0,053	-0,023	<u>0,106</u>	0,038	0,041	0,023	0,088	<u>-0,134</u>	-0,062
i.quan 2	-0,031	-0,063	-0,028	0,010	<u>-0,127</u>	0,040	-0,126	-0,073	-0,099	-0,086	0,083

Source: it has been compiled by the author

The assessment of the interrelationship between knowledge application, use and support, and the speed, quality and quantity of innovations in service companies shows as follows (Table 5):

Table 5. Correlation matrix of the relationship between application of knowledge (k.app: knowledge use, knowledge maintaining) scores and innovations

	<i>k.App1</i>	<i>k.App2</i>	<i>k.App3</i>	<i>k.App4</i>	<i>k.App5</i>	<i>k.App6</i>	<i>k.App7</i>	<i>k.App8</i>	<i>k.App9</i>
i.spe1	-0,072	-0,029	<u>0,174</u>	0,017	-0,026	0,086	<u>-0,125</u>	0,009	0,100
i.spe2	-0,065	-0,025	<u>0,138</u>	0,047	0,088	<u>0,102</u>	0,008	<u>0,109</u>	0,001
i.spe3	-0,059	0,060	-0,088	0,002	-0,025	0,093	-0,039	0,064	-0,080
i.spe4	-0,021	<u>-0,118</u>	-0,079	<u>-0,110</u>	<u>-0,112</u>	-0,033	<u>-0,107</u>	0,022	-0,008
i.spe5	<u>-0,141</u>	0,043	0,027	-0,058	-0,091	0,090	-0,040	0,039	<u>-0,117</u>
I.qua1	0,033	-0,093	0,060	0,075	-0,031	0,066	0,088	<u>0,124</u>	-0,084
I.qua2	-0,002	0,010	-0,049	-0,060	<u>0,118</u>	<u>0,107</u>	0,005	-0,059	-0,083
I.qua3	0,022	0,092	<u>-0,121</u>	<u>-0,120</u>	-0,067	0,036	-0,061	-0,088	-0,076
I.qua4	-0,008	-0,064	0,005	0,019	0,063	0,013	-0,071	-0,060	0,099
I.qua5	-0,037	-0,066	<u>-0,105</u>	-0,033	<u>-0,129</u>	-0,023	<u>0,135</u>	-0,013	-0,055
i.quan1	<u>0,197</u>	<u>0,129</u>	-0,013	0,052	0,004	<u>0,138</u>	-0,084	0,016	0,048
i.quan2	-0,008	-0,054	-0,070	-0,087	<u>-0,137</u>	0,038	-0,032	<u>0,107</u>	<u>-0,159</u>

Source: it has been compiled by the author

1) all variables in a certain way affect the speed, quality, number of innovations directly or indirectly; 2) in general, there is a low correlation between all variables; 3) they negatively affect innovation, encouraging the use of knowledge and experience gained

from previous projects; application of knowledge in the development of new products, services (in particular, on quality); the responsibility of the relevant staff for regularly updating knowledge and supporting the use of knowledge in the database; appointment of a manager, a senior employee to solve knowledge needs; existence of a clear policy or strategy for dealing with knowledge.

DISCUSSION

In the course of the research, similar and different features of the influence of knowledge management on innovation of service companies have been revealed. Therefore, a direct and indirect relationship between these variables has been established in a number of studies. Considering the fact that the estimated correlation coefficients between manufacturing, integration, application of knowledge are quite low, it is possible to assume a complex structure and indirect relationships between the specified factors on the speed, quality and quantity of innovations in enterprises. Ode & Ayavoo (2020) have also noted that knowledge management practices contribute to firm innovation both directly and indirectly.

The next important conclusion of the research lies in the fact that the strategy of personalization significantly prevails in its use in knowledge management compared to the codification strategy. Consequently, the survey indicates an insignificant practice in the use of systems, technologies for the generation, accumulation, storage, use, dissemination of knowledge. According to the viewpoint of Greiner, Böhmman & Krcmar (2007), organizations, carrying out product or process innovation, should foremost use the personalization strategy. Accordingly, the service companies under study are focused to a greater extent on processes, the optimization of which significantly affects interaction with clients and the efficiency of operations. Similar to the investigation of López-Nicolás & Meroño-Cerdán (2011), the present research reveals the direct and indirect effects of codification and personalization strategies on various aspects of organizational performance and innovation (López-Nicolás & Meroño-Cerdán, 2011). Ngoc Thang & Anh Tuan (2020) have also determined that the personalization strategy is more important than the codification strategy in terms of direct impact on innovation activities.

The third significant conclusion is as follows: the production, integration and use of knowledge have different effects on the speed, quality and quantity of innovations, which is manifested in the correlation between the variables (direct and indirect). This once again confirms the complex structure of the relationship between knowledge and innovation, which

depends on the competencies of personnel, existing information and data management technologies, methods and practices of production, integration and application. On the contrary, other studies state that the processes of obtaining knowledge and responding to them in a timely manner for the implementation of innovations are the most significant compared with the processes of dissemination of knowledge, which are less important (Darroch & McNaughton, 2002). Mardani, Nikoosokhan, Moradi & Doustar (2018) found that processes of knowledge creation, integration and application contribute to innovation. At the same time, the creation of knowledge has a more significant impact on the speed, quality and quantity of innovations. In contrast, Lin, Che & Ting, (2012) note that market knowledge and customer knowledge management are important innovation drivers, mediating the relationship between market orientation and product innovation performance. This once again confirms the conclusion of this research about the complex structure of the relationship between the objects of study. Mardani, Nikoosokhan, Moradi & Doustar (2018) have also noted that knowledge management influences innovation and organizational performance directly and indirectly through increased innovation capacity. Abbas & Sağsan (2019), similar to the present academic paper, have also revealed that knowledge creation and acquisition have a small impact on knowledge management variables and have no significant effect on innovation for both manufacturing and service firms of all sizes. The complex structure and low relationship between knowledge management and innovation can be explained by the fact that, according to the viewpoint of Oliva & Kotabe (2019), the effective use of management practices requires a higher degree of innovation maturity, decision-making and the company's level of scalability (Oliva & Kotabe, 2019).

It is also worth noting the low innovativeness of the service companies under consideration, in particular, in the practice of knowledge management, and the low impact of knowledge and information on the innovation of services and processes in the Ukrainian market. Similar conclusions have been also made in the investigation of Nowacki & Bachnik (2016), who have revealed the low innovativeness of Polish enterprises in the field of knowledge management. This once again confirms that knowledge management as an innovation development strategy depends on the market and the context in which it is used.

CONCLUSION

The conducted research on knowledge management in service companies as a strategy of innovative development has established the low culture of using this concept in the Ukrainian

context. The present academic paper reveals similar and distinctive features of the impact of knowledge management on the innovations of service companies, direct and indirect relationship between variables, complex structure and indirect impact of production, integration, application of information on the speed, quality and quantity of innovations in enterprises. The complex structure of the relationship between knowledge and innovative activity can be a consequence of insufficient level of personnel competencies, available information and data management technologies, methods and practices of production, integration and application. Consequently, the low innovativeness of the service companies under study has been revealed in the context of focusing on the system and manufacturability of companies, in particular, in the practice of knowledge management, as well as the low impact of knowledge and information on the innovation of services and processes in the Ukrainian market. This is precisely why the strategy of personalization significantly prevails in its use in knowledge management compared to the codification strategy, which is manifested in the limited practice of using systems and technologies for the generation, accumulation, storage, use, dissemination of knowledge. In addition, the use of the personalization strategy is explained by the fact that the service companies under study focus more on processes, the optimization of which significantly affects interaction with customers and the efficiency of operations.

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APPENDIX A

A.1. Production of knowledge (k.pro)

- External knowledge acquisition:

Specific staff in my workplace is responsible for obtaining knowledge from external Sources,

My work output relies on knowledge input externally.

Experienced staff is recruited externally.

- Internal knowledge acquisition:

Job rotation is encouraged in my Workplace.

Experienced staff and staff approaching departure are invited to record their knowledge and experience.

I learn lessons after project closure.

- Knowledge creation:

I am encouraged to find alternative solutions for existing assignments in my workplace.

Work-related suggestions are encouraged in my workplace.

Existing knowledge is used to develop new knowledge in my workplace.

I am encouraged to identify best practice for future use.

I am encouraged to analyse success factors to enrich my knowledge. I am encouraged to analyse mistakes to enrich my knowledge.

A.2. Integration of Knowledge (k.int)

- Knowledge storage:

Data and information are selected and organized before being stored in my workplace.

Knowledge is recorded by electronic tools (soft copy) in my workplace. Knowledge is recorded in paper medium (hard copy) in my workplace.

Knowledge resides in human memory (minds) in my workplace.

Knowledge is kept in personal reference file(s).

Knowledge resides in my organization's routines/procedures.

Knowledge is recorded in the form of documentation such as office manuals, work practice, in-house standards, lessons learned, etc.

Confidential/sensitive information has restricted access in my workplace.

Access to some knowledge is recorded.

I know where to find knowledge when I need it.

I know who to ask for knowledge when I need it.

- Knowledge distribution:

Experienced staff in my workplace is encouraged to mentor new or less experienced staff.

Knowledge gained from different projects is made accessible to all in my workplace.

Knowledge is transferred by electronic means throughout the office.

Knowledge is distributed through documentation in my workplace.

Knowledge is shared by daily interaction with colleagues in the workplace, e.g. in the corridor, during lunch, in the pantry, at social functions.

Knowledge is transferred by face-to-face means only.

Staffs who share knowledge receive rewards/recognition in my workplace.

The office layout in my workplace encourages staff to share knowledge.

Knowledge sharing is a measure of employees' performance in my workplace.

Remote access to the workplace's database is provided.

Staff with specific expertise is assigned to specific project(s)

A.3. Application of Knowledge (k.app)

- Knowledge use:

I utilize knowledge to solve most problems that I encounter in my job.

I am encouraged to apply knowledge/experience learned from previous project(s) to subsequent project(s).

I apply knowledge in developing new products/services.

- Knowledge maintaining:

Specific staff in my workplace is responsible for regular updating of knowledge in the database/library.

Specific staff in my workplace is responsible for maintaining the applicability of the knowledge in the database/library.

I am able to obtain the necessary knowledge when I need it.

A manager/senior staff member is assigned to deal with knowledge needs.

There is a clear policy/strategy in my workplace of how to handle knowledge.

A.4. Innovation speed (i.spe)

Our organization is quick in coming up with novel ideas as compared to key competitors.

Our organization is quick in new product launching as compared to key competitors.

Our organization is quick in new product development as compared to key competitors.

Our organization is quick in new processes as compared to key competitors.

Our organization is quick in problem solving as compared to key competitors.

A.5. Innovation quality (i.qua)

Our organization does better in coming up with novel ideas as compared to key competitors.

Our organization does better in new product launching as compared to key competitors.

Our organization does better in new product development as compared to key competitors.

Our organization does better in processes improving as compared to key competitors.

Our organization does better in management improving as compared to key competitors.

A.6. Innovation quantity (i.quan)

The number of new or improved products and services launched to the market is superior to the average in your industry.

The number of new or improved processes is superior to the average in your industry.

A.6. Innovation Type.

What product innovations have been introduced in the company in the last 12 months?

What innovative services have been introduced in the company over the past 12 months?

What innovative business processes have been implemented in the company over the past 12 months?

APPENDIX B

Average scores, standard deviation, minimum and maximum scores by respondents of knowledge management, innovations in service companies

	Average value	Standard deviation	Minimum	Maximum
A.1. Production of knowledge (k.pro)	5,1	0,3	4,2	5,9
- External knowledge acquisition:	5,1	0,6	3,2	6,5
Specific staff in my workplace are responsible for obtaining knowledge from external Sources,	4,9	1,1	3,0	7,0
My work output relies on knowledge input externally.	5,1	1,1	3,0	7,0
Experienced staff is recruited externally.	5,2	1,2	3,0	7,0
- Internal knowledge acquisition:	5,0	0,6	3,1	6,8
Job rotation is encouraged in my Workplace.	5,0	1,1	3,1	7,0
Experienced staff and staff approaching departure are invited to record their knowledge and experience.	5,0	1,2	3,0	7,0
I learn lessons after project closure.	5,1	1,2	3,0	7,0
- Knowledge creation:	5,1	0,6	3,5	6,3
I am encouraged to find alternative solutions for existing assignments in my workplace.	5,0	1,2	3,0	7,0
Work-related suggestions are encouraged in my workplace.	5,1	1,2	3,0	7,0
Existing knowledge is used to develop new knowledge in my workplace.	5,1	1,2	3,0	7,0
I am encouraged to identify best practice for future use.	5,1	1,2	3,0	7,0
I am encouraged to analyse success factors to enrich my knowledge. I am encouraged to analyse mistakes to enrich my knowledge.	5,1	1,1	3,0	7,0
A.2. Integration of Knowledge (k.int)	5,0	0,3	4,4	6,0
- Knowledge storage:	5,0	0,4	4,2	6,0
Data and information are selected and organized before being stored in my workplace.	5,0	1,1	3,0	7,0
Knowledge is recorded by electronic tools (soft copy) in my workplace. Knowledge is recorded in paper medium (hard copy) in my workplace.	5,1	1,1	3,0	7,0
Knowledge resides in human memory (minds) in my workplace.	5,1	1,2	3,0	7,0
Knowledge is kept in personal reference file(s).	5,0	1,2	3,0	7,0
Knowledge resides in my organization's routines/procedures.	4,9	1,1	3,0	7,0
Knowledge is recorded in the form of documentation such as office manuals, work practice, in-house standards, lessons learned, etc.	5,1	1,2	3,0	7,0
Confidential/sensitive information has restricted access in my workplace.	5,0	1,2	3,1	6,9
Access to some knowledge is recorded.	4,9	1,2	3,0	7,0
I know where to find knowledge when I need it.	5,0	1,2	3,0	7,0
I know who to ask for knowledge when I need it.	4,9	1,1	3,0	6,9

- Knowledge distribution:	5,1	0,3	4,1	6,0
Experienced staff in my workplace is encouraged to mentor new or less experienced staff.	5,0	1,2	3,1	7,0
Knowledge gained from different projects is made accessible to all in my workplace.	5,2	1,1	3,0	7,0
Knowledge is transferred by electronic means throughout the office.	4,9	1,1	3,0	7,0
Knowledge is distributed through documentation in my workplace.	5,0	1,2	3,0	7,0
Knowledge is shared by daily interaction with colleagues in the workplace, e.g. in the corridor, during lunch, in the pantry, at social functions.	5,1	1,2	3,0	7,0
Knowledge is transferred by face-to-face means only.	5,1	1,1	3,0	7,0
Staffs who share knowledge receive rewards/recognition in my workplace.	4,9	1,2	3,0	7,0
The office layout in my workplace encourages staff to share knowledge.	5,0	1,1	3,0	7,0
Knowledge sharing is a measure of employees' performance in my workplace.	5,1	1,3	3,0	7,0
Remote access to the workplace's database is provided.	5,1	1,2	3,0	7,0
Staff with specific expertise is assigned to specific project(s)	5,1	1,1	3,0	7,0
A.3. Application of Knowledge (k.app)	5,0	0,4	3,8	5,9
- Knowledge use:	5,0	0,6	3,3	6,7
I utilize knowledge to solve most problems that I encounter in my job.	5,0	1,1	3,0	6,9
I am encouraged to apply knowledge/experience learned from previous project(s) to subsequent project(s).	5,0	1,2	3,0	7,0
I apply knowledge in developing new products/services.	5,1	1,2	3,0	7,0
- Knowledge maintaining:	5,0	0,5	3,6	6,2
Specific staff in my workplace is responsible for regular updating of knowledge in the database/library.	5,0	1,1	3,0	6,9
Specific staff in my workplace is responsible for maintaining the applicability of the knowledge in the database/library.	5,0	1,1	3,0	6,9
I am able to obtain the necessary knowledge when I need it.	5,1	1,2	3,0	7,0
A manager/senior staff member is assigned to deal with knowledge needs.	4,9	1,1	3,0	7,0
There is a clear policy/strategy in my workplace of how to handle knowledge.	5,1	1,2	3,0	7,0
A.4. Innovation speed (i.spe)	5,1	0,5	3,6	6,1
Our organization is quick in coming up with novel ideas as compared to key competitors.	5,0	1,2	3,0	7,0
Our organization is quick in new product launching as compared to key competitors.	5,1	1,2	3,0	6,9
Our organization is quick in new product development as compared to key competitors.	5,1	1,2	3,0	7,0

Our organization is quick in new processes as compared to key competitors.	5,1	1,1	3,0	7,0
Our organization is quick in problem solving as compared to key competitors.	5,1	1,2	3,0	7,0
A.5. Innovation quality (i.qua)	5,0	0,5	3,6	6,3
Our organization does better in coming up with novel ideas as compared to key competitors.	5,0	1,2	3,0	7,0
Our organization does better in new product launching as compared to key competitors.	4,8	1,1	3,1	7,0
Our organization does better in new product development as compared to key competitors.	5,1	1,2	3,0	7,0
Our organization does better in processes improving as compared to key competitors.	5,0	1,2	3,0	7,0
Our organization does better in management improving as compared to key competitors.	5,0	1,2	3,1	7,0
A.6. Innovation quantity (i.quan)	5,0	0,9	3,2	6,8
The number of new or improved products and services launched to the market is superior to the average in your industry.	5,0	1,2	3,1	6,9
The number of new or improved processes is superior to the average in your industry.	4,9	1,2	3,0	7,0