SocioEconomic Challenges, Volume 6, Issue 4, 2022
ISSN (print) – 2520-6621, ISSN (online) – 2520-6214

KNOWLEDGE ASSET AS COMPETITIVE RESOURCE

Franc Vidic, https://orcid.org/0000-0001-8877-0437

PhD, Dean of Higher vocation education in Biotechnical center Naklo, University of Ljubljana, Slovenia

Corresponding author: Franc Vidic, francvidic07@gmail.com
Type of manuscript: research paper

Abstract: *Knowledge is a strategic, high-quality source of power. Knowledge assets – technological and human capital - have been recognized as key resource for sustaining competitive advantage in a dynamic turbulent environment. Past research argued that knowledge is important to facilitate and leverage knowledge assets. Most of the firm's knowledge and skills reside in its human capital, often in tacit and explicit knowledge. Existing knowledge is not enough to be competitive on the future market. Firms must collect, disseminate and create knowledge capital. According to the theory of dynamic organization knowledge creation (SECI; processes of socialization, externalization, combination and internalization), knowledge assets are the key elements that facilitate knowledge creation processes. Knowledge can be created on personal / organizational level, and also externally, such as with customers, partners and suppliers. Nonaka, Toyama and Konno (2005) identified four dimensions of construct of organizational knowledge capital: experimental knowledge assets, conceptual knowledge assets, routine knowledge assets and system knowledge assets. Each form of knowledge has specific individual support in process of knowledge creation. The firms needs vision and synchronized entire team.*

This paper employed a survey instrument and collected data in Slovenia. Our research confirmed Nonaka, Toyama and Konno (2005) research, we confirmed all four dimensions of organizational knowledge capital. Total 195 responses were analysed. The study shows importance to create learning environment, networking between professionals, to build trust encourage open, share / disseminate knowledge and create new knowledge.

Key words: small and medium sized business (SMEs), competitiveness, knowledge capital, knowledge creation.

JEL Classification: A290.

Received: 13.08.2022 **Accepted:** 11.10.2022 **Published:** 31.12.2022

Funding: There is no funding for this research.
Publisher: Sumy State University, Ukraine.
Founder: Sumy State University, Ukraine.

Cite as: Vidic, F. (2022). Knowledge asset as competitive resource. *SocioEconomic Challenges*, *6*(4), 8-20. https://doi.org/10.21272/sec.6(4).8-20.2022

1. Introduction

Everyone constantly faces some kind of competition (Korposh, Lee, Wei, Wei, 2011). Developing successful innovations is essential for creating and sustaining a firm's competitive advantage. The environment is changing constantly and rapidly as well as the market and customer's needs (Prajogo, Ahmed, 2006). Firm's sustainable competitive advantages and superior performance are determined by the procession of valuable, rare, and imperfectly imitable resources (Barney, 1991). Companies need to develop flexibility and learn how to deal with growing complexity. They need not only to adapt to the current environment but also to anticipate future trends. Changes in present networked, knowledge society raise new challenges to human competences (Paavaola, Hakkarainen, 2005). Knowledge is a strategic, high-quality source of power (Grant, 1996) and the lever of progress (Toffer, 1991), it provides better performance and adapts to market conditions (Miller, Shamsie, 1996),

and represents an important element of the search for business opportunities (Autio, Sapienza, Almeida, 2000). Knowledge represents a potential source of efficiency and profit (Senoo, Magnier-Watanabe, Salmador, 2007). Resources that are rare and valuable can yield competitive advantage (Priem, Butler, 2001). The ability to create and use knowledge is an important source (Cyert, Kumar, Williams, 1993; Nonaka, 1991, 1994; Nonaka, Takeuchi, 1995).

Two theories contribute to the perception of importance of human capital and knowledge for the organization and its strategy*: 1) resource based theory* (RBT) and 2) *knowledge based theory* (KBT). Both theories stress the importance of intellectual property to explore business opportunities and strategic implementation of different activities to achieve competitive advantage and performance (Barney, 1991; Huggins, Izushi, 2007; Lockett, Thompson, Morgenstern, 2009, Penrose, 1959, and others), and emphasize the importance of knowledge capital. Knowledge holders are individuals who recognize and seize the opportunities and jointly implement the company's mission and vision (Miller, 2002). Identifying business opportunities is a subjective process, partly expressed through the personality of the entrepreneur, and partly through his social and intellectual capital (Scott, Venkataraman, 2000). Articulable and tacit knowledge can be relevant to opportunity-seeking and advantage-seeking behaviours (Lane, Lumbatkin, 1998), because articulable or explicit knowledge can be codified in several forms, including formal language and mathematical statements, it can be easily transferred (Dess & Picken, 1999). In contrast, tacit knowledge embedded in uncodified routines including the firm's collaborative working relationships and its social context (Hitt, Bierman, Shimizu, Kochhar, 2001). Said differently, tacit knowledge is reveal through its application and can be acquire only through practice (Grant, 1996). The value of tacit knowledge often expands through additional applications and sharing among those possessing both articulable and tacit knowledge. Thus, knowledge is infinitely expandable; indicating that no matter how much or how often it is used, knowledge is not a perishable good (Dess & Picken, 1999).

Businesses compete in new challenges with responsiveness and creating new knowledge. The cornerstone of creating knowledge represents knowledge capital. In accordance to the theory of dynamic organizational knowledge creation (Nonaka, Takeuchi, 1995) the authors (Nonaka, Toyama, Konno, 2000) established the important role of four categories of knowledge assets that will enable the process of creating new knowledge. In this study, which was conduct among Slovenian small and medium-sized businesses (SMEs) we checked the existence of four knowledge assets categories: knowledge assets experience KA, the conceptual KA, routine KA, systemic KA.

In the first part of article, we present summaries of the study of scientific and technical literature in the field of creation and knowledge capital. The second part presents the results of an empirical analysis based on data obtained from the study of the construct of knowledge capital, which carried out between Slovenian entrepreneurs.

2. Literature Review

Knowledge creation vs. knowledge capital

There are several classifications of knowledge (Matušík, Hill, 1998). Knowledge is a strategic resource that brings together the skills of individuals, the team, and the organization focused on solving problems. Nonaka, Toyama and Konno (2000) define it as "a specific asset of the organization, which enables the creation of added value and competitiveness." Knowledge is extremely complex. Davenport and Prusak (1998) define it as a changing set of experiences, values, contextual information, their own beliefs, which represent the framework for evaluating and incorporating new knowledge and information. Knowledge is not just a collection of data and information (Davenport, Prusak, 1998), it occurs when the data and information are transform through the process and contextualized in the social interaction between individuals and organizations and are interpreted by the individual (Nonaka, Takeuchi, 1995; Nonaka, Toyama, Konno, 2000; Chou, He, 2004). Knowledge is collected in the organization, or in its flows (Dierickx, Cool, 1989 and Thornhill, 2006).

Most of the firm's knowledge and skills reside in its human capital, often in tacit and explicit knowledge (Nonaka, 1991; Polanyi, 1966). Tacit knowledge is contextually-specific to the individual and from the individual holder of knowledge, difficult to dispose of and transmit (Davenport, Marchand, 1999). In the meantime, explicit knowledge can be stored, coded, collected and transmitted. Tacit knowledge is transformed into explicit and vice

versa through the processes of socialization, externalization, combination and internalization (Nonaka, Takeuchi, 1995).

Kogut and Zander (1992) establish the key for studying the role that knowledge plays in the firm. Their model shows the relationship between perspectives that can be take on analysing knowledge. On one hand, we can see static perspective, related to knowledge stocks or intellectual capital, and on the other hand, we can see a dynamic analytic perspective, related to knowledge creation and organizational learning (De Castro, Lopez-Saez, Navas-Lopez, 2008).

Knowledge assets refer to all intellectual resources an organization has access to that it may use, invest and leverage for growth. Knowledge assets are inputs, outputs and moderating factors of th knowledge creating factors (Nonaka, et al, 2005). Knowledge is an important source for providing a competitive advantage, so it is necessary to collect, create and use it. They also exist externally, such as with customers, partners and suppliers (Handa, Pagani, Bedford, 2019).

Knowledge creation process allows the firm to amplify knowledge embedded internally and transfer knowledge into operational activities to improve efficiency and create business value. At the base knowledge creating process are knowledge assets. Assets is define as 'firm specific resources that are indispensable to create values for the firm' (Nonaka, et al, 2005). The firm's total stock of knowledge increased through social interactions between articulable and tacit knowledge (Dess, Lumpkin, 2001). Articulable knowledge tends to contribute to competitive parity while tacit knowledge is more commonly the source of competitive advantage (Nonaka, et al, 2005) 2002). Moreover, the value of tacit knowledge often expands through additional applications and sharing among those possessing both articulable and tacit knowledge. Thus, knowledge is infinitely expandable, it is indicated that no matter how much or how often it is used; knowledge is not a perishable good (Dess, Picken, 1999).

Organizational knowledge creation contributes to the development of knowledge (Nonaka, Takeuchi, 1995). In Nonaka and Takeuchi's (1995) theory of the knowledge-creating process, they adopt the traditional definition of knowledge as justified true belief. The process of creation of knowledge within the organization may include elements of entrepreneurship and market orientation, which is convert into knowledge capital (Li, Huang, Tsai, 2009). In this paper, we focus on the dynamic theory of knowledge creation (Nonaka, Takeuchi, 1995), which represents the core of contextualization methods streaming between tacit and explicit knowledge, between individuals, groups and companies.

Dynamic theory of organizational knowledge creation is based on four processes (SECI): socialization, externalization, combination and internalization (Nonaka, Takeuchi, 1995), to their foundation - knowledge capital (Nonaka, Toyama, Konno, 2005). The amount of knowledge in an organization depends on the input (input), dissemination (output) and moderator/activist processes of knowledge creation (Nonaka, Takeuchi, 1995). It represents the specific property that enables the creation of competitive benefit (Nonaka, Toyama, Konno, 2005). Chou, He (2004) and Chou, Chang (2004) confirmed the interaction of individual groups within the process (SECI) create knowledge). For better understanding of knowledge capital and its role in the process of creating new knowledge Nonaka, Toyama and Konno (2005) suggest four different categories of knowledge assets: (1) experimental, (2) conceptual, (3) routine and (4) systemic knowledge assets.

Experimental knowledge assets consist of tacit knowledge and can be share with the direct intervention and the common experience of individuals. Skills and knowledge of individuals are transferred among employees, customers, suppliers as well as among those in associated companies (Chou, He, 2004). Capital on the base of experience includes skills - "know how" individuals (Nonaka, Toyama, Konno, 2005). There are other forms of knowledge: 1) emotional knowledge (care, love and trust), 2) psychological knowledge such as gestures, facial clarification, 3) vigorous knowledge such as viability, enthusiasm and focus, 4) rhythmic knowledge, which allows the entry and improvisation. Given that this knowledge is difficult to imitate, collect, evaluate and market (Chou, He, 2004), it plays an important role in shaping the competitive advantages of the organization. Research authors Becerra-Fernandez and Sabherwal (2003) show that this type of knowledge is important in the process of internalization; this is a process where individuals gather knowledge through observation and conversation with others.

Conceptual knowledge assets include explicit knowledge, which is reflected in symbols, characters, language and other forms, as for example in the design and concept of products (Nonaka, Toyama, Konno, 2000). Its value is based on the perception of customers and employees. For example, the brand value depends on the perception of the customer. Capital conceptual assets are defined by articulation; they include elements that can be used when designing new products. Conceptual knowledge is arranged in an explicit form in the process of externalization. Externalization begins when individuals try to display their knowledge through analogies, metaphors, and problem solving (Becerra-Fernandez, Sabherwal, 2003). Through this process knowledge is becoming more acceptable and understandable to other team members. Capital conceptual knowledge leads to a more accurate focused specialization in a particular field (or declarative to know what knowledge is).

The next stage is to systematize knowledge of systemic knowledge assets and edit it in an explicit form with detailed specifications, manuals and files (Nonaka, Toyama, Konno, 2000). Knowledge becomes visible and tangible. System knowledge assets include proprietary intellectual property such as patents, licenses and other official documents. The systematic transfer of knowledge capital is easy and convenient to provide to individuals and groups. This knowledge could be shared and combined. Process definition combination (Nonaka, Toyama, 1995) is the transformation of a complex knowledge into more complex and systemically regulated explicit knowledge. In terms of transformation of knowledge to explicit knowledge gathered in and outside the organization as well as combined, edited and processed in the new knowledge (Chou, He, 2003). Combination is the process of managing declarative knowledge, with the aim of combining against objectives.

Explicit knowledge is further internalized and becomes a part of the routine knowledge assets such as "know-how": the daily work routines, organization, and culture of the organization. In this case, we are dealing with tacit knowledge of the organization, which is based on routine activities and practices in their daily work (Nonaka, Toyama, Konno, 2005). Dominated by procedural knowledge, organization members share, connect and continue the current practice in thinking and activities. Socialization is the process of transforming new tacit knowledge through sharing experiences. Knowledge that we want to share in the course of socialization is temporally and spatially restricted to the work experience ... socialization represents a pooling of knowledge and resources from a variety of disciplines (Chou, He, 2004).

Table 1. Expressed appropriateness between knowledge assets and SECI

Task domain/Task orientation	**Focused**	**Broad**
Content	Externalization (Conceptual knowledge assets*)*	Combination (Systemic knowledge assets)
Process	Internalization (*Experimental* knowledge assets*)*	Socialization *(Routine* knowledge assets*)*

Source: S.W. Chou, M.Y. He, Knowledge management: the distinctive role of knowledge assets in facilitating knowledge creation, 2004.

He and Chou (2004) studied the impact of different forms of knowledge in the various stages of the process of creating knowledge SECI (socialization, externalization, combination and internalization). They found influence of the conceptual knowledge in the process of externalization, and the impact of capital routine knowledge in the process of socialization. Knowledge capital on the experience basis has not been proven as the capital with large effects on the process of internalization in the creation of knowledge, etc. as well as the knowledge capital system does not have a specific impact on the process of combination.

In this article, we are focused on dynamic aspect. This dynamic aspect knowledge includes the context, methods and environment that enable social interaction between the individuals in the transformation of tacit to explicit knowledge (Chou, He, 2004).

3. Research Design and Methods

Nonaka, Toyama and Konno (2000) have identified four categories of knowledge capital to support the processes of organizational knowledge creation theory (SECI - socialization, externalization, combination and internalization) (Nonaka, Takeuchi, 1995). To confirm the findings of the authors, including the Slovenian entrepreneurs, we conducted a survey.

We used the method of the survey by mail. To participate in the survey, we invited 2,500 entrepreneurs and managers of small and medium-sized enterprises, organizations with more than 6 and less than 250 employees in Slovenia. We assumed that the directors would gladly accept the invitation to participate in the study and complete and return duly completed survey sheets. According to the experience we expected close to two hundred completed questionnaires, which would meet the recommendation of the authors Hair, Black, Balbin and Anderson (2010), saying that the number of participants must be more than a hundred units to carry out the factor analysis. When designing the entire questionnaire and data collection technology, we followed the methodology and the advice provided by Dillman (2000).

This study examined four dimensions of the construct of knowledge assets: *experimental* knowledge assets and *routine* knowledge assets, conceptual knowledge assets, capital conceptual knowledge, systemic knowledge assets (Nonaka, Toyama, Konno, 2000). Each of the categories of assets was tested with ten arguments developed by Chou and He (2004). The respondents were asked to what extent they agree with the statements above on a five-point Likert scale, where 1 means "strongly disagree" and 5 means "totally agree".

Sample selection and data collection

The sample for this study was drawn from different places in Slovenia. A sample of 2500 respondents was selected from the SMEs firms with more than 6 and less than 250 employees from the Slovenian information database (IPIS). A classic mail was sent to the target respondents inviting them to participate in the survey by completing the questionnaire. 203 responses were received and four of them were without any data on it and another four were incomplete. The remaining 195 valid and complete questionnaires were used for the quantitative analysis. It represented a useable response rate of 7,8 %. A comparison between sent and returned questionnaires is shown in Table 1.

Table 2. Comparison between sent and returned questionnaires according to the number of full and part-time employees

	Sent questionnaires		Returned questionnaires	
No. of employees	**Frequency**	**Percentage (%)**	**Frequency**	**Percentage (%)**
6–9	968	38,72	57	28,64
10–19	853	34,12	62	31,16
20–49	480	19,20	46	23,12
50–99	129	5,16	24	12,06
100–250	70	2,80	10	5,02
No answer			4	
Cumulative	2500	100,00	203	100,00

Source: author's elaboration.

The data from returned questionnaires was first entered into the database, then a descriptive analysis was performed, the data was then reviewed and the missing values were analyzed. The construct of knowledge capital was analyzed by exploratory and confirmative factor analysis using the software SPSS and EQS.

Descriptive analysis

Before we began with the analysis of the construct of knowledge assets, descriptive analysis was performed for each of the variables of each of the four categories of theoretical knowledge assets. We checked their characteristics (standard deviation, skewness and kurtosis), and whether they are suitable for factor analysis.

Table 3. Experimental knowledge assets: mean, standard deviation, skewness, kurtosis

Experiential knowledge assets	N	Mean	St. deviation	Skewness	St.error	Kurtosis	St.error
Employees are encouraged to share their hands-on experience.	199	3,91	0,947	-0,729	0,172	0,202	0,343
Employees are willing to share their experience.	200	3,94	0,946	-0,660	0,172	-0,087	0,342
Employees are encouraged to express their emotional knowledge such as care and love	199	3,18	1,062	-0,215	0,172	-0,666	0,343
Employees are encouraged to trust people in other workgroups.	198	3,21	1,014	-0,042	0,173	-0,384	0,344
Employees are encouraged to acquire and accumulate know-how through experiences at work.	199	3,68	0,920	-0,458	0,172	-0,220	0,343
Employees are encouraged to demonstrate their enthusiasm.	198	3,46	0,932	-0,257	0,173	-0,398	0,344
Employees are encouraged to demonstrate their improvisation.	198	3,45	1,000	-0,273	0,173	-0,483	0,344
Firms value the existence of every employee.	194	3,85	0,962	-0,507	0,175	-0,357	0,347
Firms clearly communicate the importance of protecting hands-on experience.	197	3,55	0,928	-0,297	0,173	-0,104	0,345
Employees are encouraged to innovate.	199	3,65	0,968	-0,697	0,172	0,394	0,343

Source: author's elaboration.

Experimental KA was monitored by ten claims (Table 3). The highest level of the respondents expressed agreement with the statement that "Employees are willing to share their experience," – mean of the responses is 3.94, the most common response is "I agree" (38.9%), standard deviation of 0.946 indicates a spread of answers on the median value. The second statement which had the highest level of agreement is the claim "Employees are encouraged to share their hands-on experience." The mean of this answer is 3.91, the standard deviation is similar to that previously described and is 0.947. Minimum acceptance was expressed in the claim "Employees are encouraged to express their emotional knowledge such as care and love," where the mean is 3.18 and the responses are quite scattered around the median value, the standard deviation is 1.062.

Table 4. Routine knowledge assets: mean, standard deviation, skewness, kurtosis

Routine knowledge assets	N	Mean	St. deviation	Skewness	St.error	Kurtosis	St.error
Provide know-how for carrying out day-to-day business.	199	3,10	1,263	-0,054	0,172	-1,019	0,343
Employees realize the importance of knowledge in routine operations.	200	3,73	0,934	-0,634	0,172	0,237	0,342
Employees are encouraged to explore new knowledge.	200	3,85	0,863	-0,548	0,172	0,246	0,342
Certain patterns of thinking and action are reinforced through continuous exercises.	199	3,71	0,934	-0,563	0,172	0,155	0,343
High levels of participation are expected in capturing and transferring knowledge.	200	3,97	0,888	-0,803	0,172	0,530	0,342
On-the-job training and learning are valued.	199	4,00	0,816	-0,619	0,172	0,327	0,343
Employees are valued for their individual expertise.	198	3,73	0,903	-0,487	0,173	-0,079	0,344
Employees are encouraged to discuss their work with people in other workgroups.	199	3,68	0,845	-0,397	0,172	0,135	0,343
Firms facilitate the interaction and transfer of new knowledge across organizational boundaries.	198	3,16	1,064	-0,072	0,173	-0,544	0,344
Overall organizational culture and objectives are clearly stated.	199	3,96	0,915	-0,600	0,172	-0,236	0,343

Source: author's elaboration.

Routine knowledge assets were tested with ten statements (Table 4). The maximum level of agreement from respondents is on a claim that "On-the-job training and learning are valued." The arithmetic mean of all responses was 4.00, a standard deviation of 0.816. The standard deviation indicates a reduction in the dispersion of responses around the centre value. Most of the answers are "agree" (47.3%) and slightly less "strongly agree" (27.6%). The following statements with a high degree of agreement are as follows:" High levels of participation are expected in capturing and transferring knowledge" and the "Overall organizational culture and objectives are clearly stated." Mean values for the answers to both questions are 3.97 and 3.96. The worst estimated claim was: "Provide know-how for carrying out day-to-day business". The mean of all responses was 3.10.

Table 5. Conceptual knowledge assets: mean, standard deviation, skewness, kurtosis

Conceptual knowledge assets	N	Mean	St. deviation	Skewness	St.error	Kurtosis	St.error
Firms demonstrate design criteria by adopting images, symbols, and language.	198	3,45	1,025	-0,262	0,173	-0,495	0,344
Firms demonstrate product characteristics by adopting images, symbols, and language.	197	3,48	1,100	-0,406	0,173	-0,488	0,345
Firms demonstrate brand equity by adopting images, symbols, and language.	197	3,42	1,083	-0,367	0,173	-0,395	0,345
Employees are encouraged to interact with other organizations (e.g. partners, customers) to establish design criteria.	196	3,37	1,012	-0,352	0,174	-0,237	0,346
Employees are encouraged to interact with other organizations (e.g. partners, customers) to establish the characteristics of products.	197	3,48	1,003	-0,686	0,173	0,261	0,345
Employees are encouraged to interact with other organizations (e.g. partners, customers) to establish brand equity.	196	3,41	1,016	-0,533	0,174	-0,014	0,346
Employees are encouraged to innovate and replace outdated knowledge.	198	3,82	0,944	-0,763	0,173	0,411	0,344
Employees are encouraged to learn from mistakes.	195	4,03	0,846	-0,926	0,174	1,119	0,346
Firms have teams devoted to promoting brand equity.	193	2,93	1,356	0,057	0,175	-1,154	0,348
Firms have teams devoted to promoting concepts or designs for new products/services.	194	2,98	1,302	-0,085	0,175	-1,102	0,347

Source: author's elaboration.

Conceptual knowledge assets were tested by determining the positions of each of the respondents – they expressed their degree of agreement with ten statements (Table 5). Claim: "Employees are encouraged to learn from mistakes" has the highest level of agreement among the respondents. The mean of all responses was 4.03, with a standard deviation of 0.846. The standard deviation shows a slightly lower dispersion. 48.8 percent of respondents accept the argument, while 28.1 percent strongly agree with the statement. A high degree of agreement of the respondents is also expressed with the statement "Employees are encouraged to innovate and replace outdated knowledge." The mean is 3.82, and standard deviation is 0.944. Statements that got the least agreement are:" Firms have teams devoted to promoting brand equity" and "Firms have teams devoted to promoting concepts or designs for new products/services." In the first case, the mean of all responses is 2.93 and 2.98 in the second.

The standard deviation in both cases indicates a high dispersion of responses around the median value.

Table 6. Systemic knowledge assets: mean, standard deviation, skewness, kurtosis

Systemic knowledge assets	N	Mean	St. deviation	Skewness	St.error	Kurtosis	St.error
Provide well-organized product documents.	196	3,89	1,071	-0,939	0,174	0,387	0,346
Provide easy access to product database or catalogue.	197	3,79	1,148	-0,891	0,173	0,019	0,345
Use the firm's intellectual property with authorization.	192	3,29	1,317	-0,112	0,175	-1,133	0,349
Protect knowledge from inappropriate use inside the organization.	195	3,23	1,264	-0,201	0,174	-0,959	0,346
Protect knowledge from inappropriate use outside the organization.	195	3,46	1,297	-0,423	0,174	-0,920	0,346
Protect knowledge from theft from within the organization.	196	3,49	1,196	-0,439	0,174	-0,677	0,346
Use patents to protect firm's precious knowledge.	194	3,60	1,188	-0,538	0,175	-0,582	0,347
Restrict access to some sources of knowledge.	196	2,96	1,331	-0,083	0,174	-1,148	0,346
Value and protect knowledge embedded in individuals.	197	3,88	1,104	-0,973	0,173	0,393	0,345
Clearly communicate the importance of protecting knowledge.	195	3,61	1,122	-0,555	0,174	-0,381	0,346

Source: author's elaboration.

Systemic knowledge assets were tested with ten claims (Table 6). The statement "Provide well-organized product documents" has the highest level of agreement among the respondents. The mean of all responses is 3.89, and standard deviation is 1.071. The standard deviation shows the wide dispersion of the measured values around the median value. 37.4 percent of respondents accept the argument, 31.5 percent of them strongly agree with the statement. There is very little difference in the level of agreement of the respondents expressed in the argument:" Value and protect knowledge embedded in individuals". The arithmetic mean of all measured positions is 3.88, standard deviation, or dispersion around the median value is slightly higher than in the previous case. The respondents expressed a minimum level of agreement in the statement "Restrict access to some sources of knowledge." The mean is 2.96 and standard deviation is 1.331. The standard deviation indicates a high dispersion of the measured values around the median value.

Construct of knowledge assets

Construct of knowledge assets refers to managers' and entrepreneurs' statement in this competitive era, everyone constantly faces some kind of competition (Korposh, Lee) in small and medium-sized enterprises. Rating normality variables showed that the ratio of the standard error of asymmetry and kurtosis of each variable is within the desired value. All values are less than 2 or greater -2. We found that the data matrix shows a sufficient number of correlations to Bartlett's test of sphericity. A statistical examination of correlations between variables showed that the correlation matrix has significant correlations (degree of freedom = 0.000). KMO measure of sampling adequacy has a value of 0.910. Bartlett's test and assessing the suitability of sampling KMO justifies the use of exploratory factor analysis.

Factor analysis using principal components of factor analysis with factor extraction and VARIMAX rotation was conducted to examine the undimensional/convergent and discriminant validity. The four common/convergent decision rules were applied to identify factors (Hair et al., 2010): (1) minimum Eigen value of 1; (2) minimum factor loading of 0,3 for each indicator item; (3) simplicity of factor structure; and (4) exclusion of single item factors. Reliability was evaluated by assessing the internal consistency of the indicator items of each construct by using Cronbach's α. A joined domain factor analysis was performed, including all of the items used to develop the research constructs. The result provided significant support for factorial/discriminant validity of the

measurement scales. We used SPSS software. First, we examined communalities and found that factor loadings 0,3 and higher will be considered significant for interpretative purposes. In the next step, we eliminated the variable "Firms value the existence of every employee," because it was its weight loaded on several factors. Variables: "Employees are encouraged to learn from mistakes" and "Provide well-organized product documents" were excluded because they were heavily loaded on the wrong factors.

When selected, numerous factors were taken into account on theoretical background, screen plot, Eigen value and the proportion of total variance explained. The graphic display has shown possible accepted number of factors from 5 to 8. The inherent value of 1,7 factors. We opted for the 7 factors; they explain more than 69.5% of the variance initial Eigen values, or 62.8% of the variance extraction sum of squared loadings.

Retained variable dimensions of the construct of knowledge assets, which appeared in explorative factor analysis shown in Table 7, are groupped into seven factors. The resulting factors are consistent with the theoretical concept of knowledge assets dimension. Dimension experimental knowledge assets are represented by factors F2 and F7. Factor F2 incorporates seven variables and factor F7 incorporates two variables. The main features of the dimensions conceptual knowledge assets are represented by three factors: F1, F2 and F3. Factor F1 combines two variables, factor F4 combines four variables and factor F5 combines five variables. The dimension of systemic knowledge assets is illustrate by a factor F3, which combines eight variables. The dimension routine knowledge assets are most represented by a factor F6, which includes 9 variables.

Table 7. Knowledge assets, Pattern matrix

	Factor						
	1	2	3	4	5	6	7
Firms have teams devoted to promoting brand equity.	0,962						
Firms have teams devoted to promoting concepts or designs for new products/services.	0,753						
Employees are encouraged to trust people in other workgroups.		0,739					
Employees are encouraged to demonstrate their improvisation.		0,731					
Employees are encouraged to express their emotional knowledge such as care and love.		0,661					
Employees are encouraged to demonstrate their enthusiasm.		0,646					
Employees are encouraged to acquire and accumulate know-how through experiences at work.		0,441				0,308	
Firms facilitate the interaction and transfer of new knowledge across organizational boundaries.		0,394					
Employees are encouraged to innovate.		0,346					
Protect knowledge from theft from within the organization.			0,903				
Protect knowledge from inappropriate use outside the organization.			0,869				
Use patents to protect firm’s precious knowledge.			0,850				
Protect knowledge from inappropriate use inside the organization.			0,789				
Restrict access to some sources of knowledge.			0,566				
Clearly communicate the importance of protecting knowledge.			0,512			0,326	
Use firm’s intellectual property with authorization.			0,459				
Value and protect knowledge embedded in individuals.			0,436			0,363	
Employees are encouraged to interact with other organizations (e.g. partners, customers) to establish the characteristics of products.				0,792			
Employees are encouraged to interact with other organizations (e.g. partners, customers) to establish design criteria.				0,755			
Employees are encouraged to interact with other organizations (e.g. partners, customers) to establish brand equity.				0,708			
Employees are encouraged to innovate and replace outdated knowledge.				0,318		0,301	
Firms demonstrate product characteristics by adopting images, symbols, and language.					-0,835		

Table 7 (cont.). Knowledge assets, Pattern matrix

	Factor						
	1	2	3	4	5	6	7
Firms demonstrate brand equity by adopting images, symbols, and language.					-0,773		
Firms demonstrate design criteria by adopting images, symbols, and language.					-0,742		
Provide know-how for carrying out day-to-day business.					-0,330		
Provide easy access to product database or catalogue.							
On-the-job training and learning are valued.						0,778	
High levels of participation are expected in capturing and transferring knowledge.						0,539	
Employees are encouraged to explore new knowledge.		0,308				0,500	
Certain patterns of thinking and action are reinforced through continuous exercises.						0,482	
Employees realize the importance of knowledge in routine operations.		0,305				0,474	
Employees are valued for their individual expertise.						0,425	
Overall organizational culture and objectives are clearly stated.						0,393	
Firms clearly communicate the importance of protecting hands-on experience.		0,307				0,327	
Employees are encouraged to discuss their work with people in other workgroups.						0,307	
Employees are willing to share their experience.							-0,754
Employees are encouraged to share their hands-on experience.							-0,702

Source: author's elaboration.

Notes: All factor loadings of 0,300 and higher were considere significant for interpretation. Maximum likelihood factoring method and oblique factor rotation.

The results of factor analysis are reliably relating to knowledge assets model are described below. Knowledge assets are categorized as dimensions constructs. Experimental knowledge assets are represented by ten variables. The main purpose of experimental knowledge assets is to facilitate the tasks with a focused domain and process orientation (Chou, He, 2004). Most of the contents of experimental knowledge assets are tacit and abstract. Experimental knowledge assets also encourage individuals to demonstrate their emotional, energetic and rhythmic knowledge such as care, love, trust, enthusiasm and improvisation. The second type of assets is routine knowledge assets represented by ten variables. Routine knowledge assets consist of the tacit knowledge routinely embedded in the actions and practices of the organization. Routine knowledge assets provide mechanisms that facilitate interaction and knowledge exchange. In addition, routine knowledge assets also encourage individuals to explore new expertise and learning (Chou, He, 2004). The third one is conceptual knowledge assets. It consists of explicit knowledge articulated through images, symbols, and language. Conceptual knowledge assets contain the mechanisms that facilitate and encourage the establishment of easy to grasp criteria such as design, product, and brand equity. Finally, thirteen items were used to represent systemic knowledge assets. These items consist of systematized and packaged explicit knowledge, such as product documents and database. In addition, systemic knowledge assets provide protection mechanism that prevents inappropriate usage of knowledge either inside or outside of organization (Chou, He, 2004). The reliability of these four measures is at a satisfactory level.

The validity of the entire construct knowledge capital has been confirmed by a confirmative factor analysis. The values that are relate to the acceptability of a model vary depending on the situation and will of course depend on the size of the sample, the number of measured variables and communalities individual factors. A simple rule how to distinguish well from bad models across all situations cannot be offered, because of the use of multiple indices at the same time. Usually, three or four indices provide sufficient information to decide on the validity of the model (Hair et al., 2010).

Recent analysis confirmed good reliability (Cronbach $\alpha = 0.95$). Cronbach α coefficient is the most common measure to confirm reliability of the indicators. Reliability measurement is described as exemplary, if Cronbach

α coefficient is greater than 0.70 (Hair et al. 2010). We examined other indices suitability model: statistics $\chi 2$, CFI, RMSE, NFI, RHO. Suitability index model statistics ($\chi 2$ = 1060.69) with 540 degrees of freedom and the coefficient of reliability (P = 0.00) indicate the suitability of the model. The same applies to the CFI index (comparative fit index), which is among the most frequently used and may assume values between 0 and 1. Higher values indicate a better model, we can say that the model is good if it is greater than 0.9. In our case, the CFI is equal to 0.96. Index RMSE (root mean square error of approximation) is an indicator that reflects the addition of the confidence interval for this value. In this case, the value of the index is 0,07. The smaller the absolute value is, the better the validity of the model is (Hair et al., 2010). Index NFI (normed fit index) may have values between 0 and 1. The index values close to 1 indicate a better model. In this case, the value of index is 0.93. The same applies to RHO index (reliability coefficient), in our case its value is 0.97. Of course, there are no absolute criteria to provide good value to indices of the construct model. Index values are only a guide (Hair et al. 2010, 705).

Based on the results of our research we confirmed the model of knowledge capital. It consists of four different dimensions: experience KA, conceptual KA, routine KA and systemic KA.

4. Conclusion

In this article, we analysed the construct of knowledge assets, which is the base of knowledge-creating processes (Nonaka, Toyama, Konno, 2000). Knowledge is created by streaming tacit and explicit knowledge (Nonaka, 1991) through the process of SECI of socialization, externalization, combination and internalization. Different processes run on different knowledge assets (Nonaka, Toyama, Konno, 2000). The authors identify four types of knowledge assets: experimental knowledge assets, conceptual knowledge assets, routine and systemic knowledge assets. Specific forms of knowledge have certain peculiarities and different individual support in processes of knowledge creation. Our study was conduct on a sample of 195 questionnaires. After a descriptive, an exploratory and a confirmative analysis we confirmed the existence of several dimensions of the construct of knowledge assets**.**

In order to create knowledge dynamically and continuously, firm needs vision that synchronizes the entire team (Nonaka, Toyama, Konno (2005). For entrepreneurs directly as well as indirectly it is important to build a network to support knowledge creation process and its development. It is important to create a learning environment and enable access to different categories of knowledge assets. Networking between professionals and their interpersonal cooperation is also important to be able to build trust and encourage open communication, share knowledge and create new knowledge.

The study represents a fraction, the mosaic of information needed to develop a comprehensive picture of complex creation of new knowledge, which needs to be upgrade. The survey does not include the important review of Slovenian researchers who have also contributed to the development of the profession. In addition**,** it is necessary to process the flow of knowledge**,** the introduction of new technologies, mobility and research globalization should also extend to the wider international environment.

Author Contributions: conceptualization: Franc Vidic; methodology: Franc Vidic; software: Franc Vidic; validation: Franc Vidic; formal analysis: Franc Vidic; investigation: Franc Vidic; resources: Franc Vidic; writing original Franc Vidic; draft preparation: Franc Vidic; writing-review and editing: Franc Vidic; visualization: Franc Vidic; supervision Franc Vidic.

Conflicts of Interest: Author declares no conflict of interest.

Data Availability Statement: Not applicable.

Informed Consent Statement: Not applicable.

References

1. Autio, E., Sapienza, H. J. and Almeida, J. G. (2000). Effects of age at entry, knowledge intensity, and immutability on international growth. *Academy of management journal*, 43, 909–924. [CrossRef].
2. Barney J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17, 99-120. [CrossRef].

3. Becerra-Fernandez, I. and Sabherwal, R. (2003). Organizational knowledge management: contingency perspective. *Journal of management information systems*, *18*(1), 35-55. [Link].
4. Chou and Chang (2006). A contingency model of knowledge creation. *The tenth Pacific Asia conference on information systems (PACIS 2006)*. [Link].
5. Chou, S. W. and He, M. Y. (2004). Knowledge management: the distinctive role of knowledge assets in facilitating knowledge creation. *Journal of information science*, *30*(2), 146-159. [Link].
6. Coleman, J.S. (1988). Sociological and economic approaches to the analysis of social structure. *The American journal of sociology*, 94, 95-120. [CrossRef].
7. Cyert, R. M., Kumar, P. and Williams, J. R. (1993). Information, market imperfections and strategy. *Strategic management journal*, 47-58. [CrossRef].
8. Davenport, T., and Marchand, D. (1999). Is KM just good information management? Data, information and knowledge are points along a continuum. Retrieved from [Link].
9. Davenport, T. and Prusak, L. (1998). Know what you know. *CIO*, *11*(9), 58-63. [Link].
10. De Castro, G. M., López-Sáez, P. and Navas-López. J. E. (2008). Organisational learning dynamics in the software publishing industry. *IJTM*, 41(1/2), 138-154. [Link].
11. Dess, G. G. and Lumpkin, G. T. (2001). Emerging issues in strategy process research. In M. A. Hitt, R. E. Freeman and J. S. Harrison (Eds.). *Handbook of strategic management*, 3–34. Oxford: Blackwell Publishers. [CrossRef].
12. Dess, G. G., and Picken, J. C. (1999). *Beyond productivity: How leading companies achieve superior performance by leveraging their human capital*. New York: AMACOM. [Link].
13. Dierickx, I., Cool, K. (1989). Asset stock accumulation and sustainable of competitive advantage. *Management science*, 35, 1504-1513. [CrossRef].
14. Dillman, D. A. (2000). *Mail and internet surveys: the tailored design method*. 2nd edition. New York; Chichester: John Wiley, 2000. [CrossRef].
15. Drucker, P. F. (1994). *The theory of the business*. Harvard business school, 96-104. [Link].
16. Drucker, P. F. (2009). A century of social transformation: emergence of knowledge society. In *Managing in a time of great change*. Boston: Harvard business press, 177-230. [CrossRef].
17. Grant, R. M. (1996). Grant, toward a knowledge-based theory of the firm. *Strategic management journal*, 17, 93-107. [CrossRef].
18. Hair, J. F., Black, W. C., Babin, B. J. and Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Upper Saddle River, NY: Pearson-Prentice Hall publisher. [Link].
19. Handa, P., Pagani, J., Bedford, D. (2019). *Knowledge assets and knowledge audits*, Emerald publising. [Link].
20. Hitt, M. A., Bierman, L., Shimizu, K. and Kochhar, R. (2001). Direct and moderating effects of human capital on strategy and performance in professional service firms: A resource-based perspective. *Academy of Management Journal*, 44, 13–28. [CrossRef].
21. Hitt, M. A. and Ireland, R. D. (2002). The essence of strategic leadership: Managing human and social capital. *Journal of leadership and organization studies*, 9(1), 3–14. [CrossRef].
22. Huggins, R. and Izushi, H. (2007). *Competing for knowledge. Creating, connecting and growing.* Routledge studies in global competition. [CrossRef].
23. Ireland, R. D., Hitt, M. A. AND Sirmon, D.G. (2003). A model of strategic entrepreneurship: the construct and its dimensions. *Journal of management*. 29(6), 963-989. [CrossRef].
24. Korposch, D., Lee, Y.C., Wei, C.C. and Wei, C.S. (2011). Modeling the effects of existing knowledge on the creation of new knowledges. *Concurent engeneering*, 19(3), 225-234. [CrossRef].
25. Kusonoki, K., Nonaka, I. and Nagata, A. (1998). Organizational capabilities in product development of Japanese firms: a conceptual framework and empirical findings. *Organizational science*, 9(6), 699-718. [CrossRef].
26. Lane, P.J., Lubatkin, N. (1998). Relative absorptive capacity and interorganizational learning. *Strategic management journal*, 19, 461-477. [CrossRef].
27. Li, Y. H., Huang, J. W. and Tsai, M. T. (2009). Entrepreneurial orientation and firm performance: the role of knowledge creation process. *Industrial marketing management*, 38, 440-449. [Link].

28. Lockett, A., Thompson, S. and Morgenstern, U. (2009). The development of the resource-based view of the firm: a critical appraisal. *International journal of management reviews*, *10*(1), 9-28. [CrossRef].
29. Matusik, S. F. and Hill, C. W. L. (1998). The utilization of contingent work, knowledge creation and competitive advantage. *Academy of management review*, *23*(1), 680-697. [Link].
30. Miller, K. D. (2002). Knowledge inventories and managerial myotopia. *Strategic management journal*, 23, 689-706. [CrossRef].
31. Miller, D. AND Shamsie, J. (1996). The resource-based view of the firm in two environments: The Hollywood film studios from 1936 to 1965. *Academy of management journal*, 39, 519–543. [CrossRef].
32. Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization science*, 5(1), 14-37. [Link].
33. Nonaka, I. (1991). The knowledge-creating company. *Harvard business review*, 69, 96-105. [CrossRef].
34. Nonaka, I. and Takeuchi, H. (1995). *The knowledge-creating company*. [Link].
35. Nonaka, I, Toyama, R., Konno (2005). SECI, Ba and Leadership: A unified model of dynamic knowledge creation in Little, S., Ray, T. Managing knowledge. SAGE. [CrossRef].
36. Nonaka, I., Toyama, R. and Nagata A. (2000). A firm as a knowledge-creating entity: a new perspective on the theory of the firm. Oxford university press, *Industrial and corporate change*, 9(1), 1-20. [CrossRef].
37. Paci, R. Marrocu, E. (2013). Knowledge assets and regional growth performance. Growth and change, a journal for urban and regional policy, 4(2), 229-257. [CrossRef].
38. Handa, P., Pagani, J. and Bedford, D. (2019). *Assigning Value to Knowledge Assets, Knowledge Assets and Knowledge Audits (Working Methods for Knowledge Management)*, Emerald Publishing Limited, Bingley, pp. 201-217. [Crossref].
39. Penrose, E., (1959). Limits to the Growth and Size of Firms. Papers and proceedings of the Sixty-seventh annual meeting of the American economic association. (May, 1955), *The American economic review*, *45*(2), 531-543. [Link].
40. Polanyi, M. (1966). *The tacit dimension*. Routledge and Kegan Paul. [Link].
41. Priem, R. L., and Butler, J. E. (2001). Is the resource-based "view" a useful perspective for strategic management research? *Academy of management review*, 26, 22–40. [CrossRef].
42. Thornhill, S. (2006). Knowledge, innovation and firm performance in high- and low-technology regimes. *Journal of business venturing*, 21, 687-703. [CrossRef].
43. Toffer, A. (1991). *Powershift: knowledge, wealth and power at the edge of the 21st century.* New York: Bantam. [CrossRef].
44. Scot, S. and Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of management review*, *25*(1), 217-226. [Link].
45. Senoo, D., Magnier-Watanabe, R. and Salmador, M. P. (2007). Workplace reformation, active ba and knowledge creation. From conceptual to a practical framework. *European journal of management*, *10*(3), 296-315. [Link].