Conceptual Mapping of Elements Impacting the Value of Knowledge

Muhammad Syed ul Haque
PhD Research Scholar, KUBS, University of Karachi, Pakistan
syed@pim.com.pk

Dr Muhammad Asim
Associate Professor, KUBS, University of Karachi, Karachi Pakistan
drasim@uok.edu.pk

Abstract

Knowledge, being one of the most critical and essential resource of any organization is now unanimously considered as an asset. Yet it has no place in any of the financial statements that can mention its value or volume. Since the true worth of an organization is largely dependent on its capability to generate positive return in the future. This positive return is primarily based on the volume and the nature of knowledge and its efficient use. And the efficient use of knowledge asset is the unique design and proposition of organizational resources which itself depends on the knowledge. Therefore, it is impossible to ascertain the true worth of an organization without determining the value of knowledge it possesses. This research work attempts to present factors that have an impact on the value of knowledge. Data was collected from professionals and decision-makers who have responsibility related to knowledge management. Starting from the desk research, followed by interviews and questionnaire instrument, the data was collected from business managers working in various industries. Various statistical tools were employed to analyze the data and evaluate the identified items and factors. Finally, the two factors were identified after regrouping of items and initial factors through Principal Component Factor analysis. The new factors were named "Strategic Advantage" and "Core Capabilities". The integration of "Strategic Advantage" and "Core Capabilities" forms the basic framework for valuing knowledge. The findings will lead to further research in knowledge management. Refinement of the suggested model would enable managers to differentiate the most valuable and useful knowledge assets from the least valuable knowledge. Investors would also benefit from the study as it may help them in evaluating/calculating the actual value/worth of an organization.

Keywords: *Knowledge, Value of knowledge, Strategic advantage, Competitive advantage.*

Introduction

Shapes and considerations for economic and financial strength for a firm have been redefined in terms of human capital which includes: intellectual capital, innovation capabilities, knowledge bank, and learning competencies (Malik & Malik, 2008). All the four factors are highly dependent on knowledge present in the organization thus makes the knowledge as an asset of vital and strategic importance for competitiveness (Feher, 2004). As a result, an effective administration of information dissemination and efficient management of knowledge has become a challenging task for organizations (Blumentritt & Johnston, 1999).

Over the decades, the knowledge management has become the most important and critical function to address the challenges presented by dynamic and competitive business environment. It includes securing information from specialists who is leaving the organization (Heisig, 2009), processes and product innovation, development of innovative product/services, controlling research and development expenses, speedier issue fathoming and resolving (Daghfous, 2003), and appropriate data frameworks for improving and sustaining enhanced business performances and competitiveness. (Duhan, et. al., 2001).

As all tangible assets have a certain lifecycle, knowledge is no exemption. Some knowledge may be at its earliest stages and few may be in their afterward stages of the life cycle. Plenteous writing is accessible on the knowledge life cycle (Cloonan, 1993), (Gallupe, 2001), however, the literature on determining the actual worth/value of knowledge amid the differing stages of its life cycle is exceptionally low in number.

This research work endeavors to identify and test elements that impact the value of knowledge during its life span. These six elements were identified during literature review. The literature review was followed by unstructured interviews of professionals working in different industries in Pakistan. These professionals would be at decision making posts and responsible for knowledge management in their respective organizations. The identified elements would be assessed through a questionnaire instrument for verification.

Literature Review

In business and economics, the word value is defined in terms of the expected market worth of tangible, intangible, and services (Renner, 2003) and is reliant on the purchasers' expected return against the expense. The knowledge is being valued in light of the fact that it benefits the business managers and decision-makers in assessing the vulnerability and uncertainty while settling on level-headed choices. Porter's (1996) 'Value Chain" model provided the idea of 'Knowledge Value Chain' (KVC) (Holsapple & Singh, 2001). The KVC provided little and initial assistance to the organization in considerate management of the knowledge resource.

Since the knowledge dwells in the human-mind (Krogstie, et. al., 2006), hence, any growth in the knowledge can't be estimated, measured, and valued.

From the concept of the knowledge life cycle, when the knowledge is at the infancy stage, it may not be helpful or useful (Birkinshaw & Sheehan, 2002). Consequently, it won't be valued, yet further improvement or development makes it useful. At the point when it gets advantageous, it will be considered as valued. Therefore, knowledge needs to consistently advance and develop itself to enhance its capacity to show up and stay helpful and subsequently become valuable. Intangible assets like software license can be valued, however, mastery in work and tacit knowledge that resides in the mind of an employee are difficult to value. In the case of tangible assets like stores and spares or inventory, one can compute the estimation of the amount being devoured which will be topped off. But the knowledge once used, is still accessible for additional utilization. A concept, a notion or an idea, if sold, can't be sold again, yet its value can scarcely be assessed based on the number of occasions it has been utilized. We use feet for height, gigabyte for data, a Yen for currency, yet, there is no particular unit to quantify and value the knowledge.

The realization and quantifying human capital is being felt by policymakers and decision-makers for a better understanding of the drivers of economic growth and operations of the labor market to understand the long-term sustainable growth. It is also important for measuring the output and productivity performance of the education industry in an economy (UNECE, 2016). The standards for Human Capital Accounting (HCA) were developed to value the physical capital goods linked with the skills embodied in the national population, thus making its monetary worth dependent on labour market incomes (Yarrow, 2020). The Language-Information-Reality (LIR) model is a multidimensional system of semantics linking the sustainable organizational development with components of knowledge, namely: expertise, competence, and capabilities (Gatarik, 2019).

As knowledge is described as a true belief (not accidental) (Unger, 1968), delicate and complex (Nozick, 1981), harmless (Sosa, 1999), fittingly caused (Goldman, 1967), and produced by the virtue of scholarly efforts (Zagzebski, 1996), therefore, knowledge is essential and important and is subjectively better compared to any epistemic standing missing the mark of knowledge. Since, it is now proved that knowledge possesses definite value. Past research studies lack a direct focus on the subject of evaluating or estimating the monetary worth of knowledge in terms of the determination of elements that has a direct or indirect impact on the value of knowledge. Therefore, this research study is focused on the determination of elements that impacts the value of knowledge.

Research Hypotheses

The six elements were initially identified in various studies. They were then cross-checked with the help of unstructured interviews with professionals working in various organizations. These professionals were identified from the business firms listed on Pakistan Stock Exchange (PSE). Solicitation for interviews with professionals having responsibility related to managing the knowledge were dispatched to seventy-two organizations. Only thirty-six interviews were conducted. All the thirty-six individuals concurred on the necessity of determining the value of knowledge (VoK). They also approved that the six elements that has been identified have sway on the VoK. However, they opined for further assessment of the six elements through some analysis. Principally agreeing with the opinion of interviewers, the researchers have developed a separate hypothesis to examine the validity with rationality of each element.

Competitive Advantage

There is a positive relationship between knowledge sharing, absorptive capacity, innovation capability, and competitive advantage in the industry with the amount and quality of knowledge (Tien, 2019). Therefore, knowledge has a demonstrable influence on strategic, organizational, and commercial on establishing a sustainable competitive advantage of an organization (Quartey, 2019). As a result, business organizations are constantly pulled into new and innovative knowledge to attain a competitive advantage in their industry. Thus, our hypothesis would be:

Hypothesis 1. The knowledge would be highly valued on the off chance that it provides a competitive advantage to the organization.

Intellectual Capital

The present day worldwide business and economic environment gives more importance to the intellectual capital (IC) over balance sheet assets (Guthrie, 2001). Certainly, there is a parallel association between innovation, investment in R&D, and a number of patents with the increase in intellectual capital (IC) (Ren and Song, 2020). Therefore, Intellectual capital has been considered as an essential means for the achievement of the competitive advantage, medium, and short-term objectives for an organization (Vitolla et al., 2020). Skilled employees having specialized knowledge are considered as IC are respected and valued in their organizations (Lyon, 2005). Thus, our hypothesis would be:

Hypothesis 2. The knowledge would be highly valued on the off chance that it enhances the intellectual capital of the organization.

Business Process Improvement

Knowledge is a critical component for business process improvement. This improvement could be in the form of increased production volume, cost reduction, quality improvement, consistency in product quality, and reduction in inputs, etc. To increase operational efficiency by decreasing quality problems to enhance customer confidence, Six Sigma techniques has been considered. It is a highly structured and systematic methodology for the improvement in process capability (Jones, Parast & Adams, 2010). Knowledge and its management effectively capitalize on the business process and brings improvement in it (Szelagowski & Wozny, 2019). Thus, our hypothesis would be:

Hypothesis 3. The knowledge would be highly valued on the off chance that it brings improvement in the business process.

Cost of Generating New Knowledge

In the present-day cut-throat business environment, cost control is critical for organizations along with quality, innovation, and consistency in outputs. The theory of Cost Engineering is mostly applied in manufacturing and aerospace related projects to manage various costs like its estimation, control, planning, and management to calculate possible return (Xu et.al., 2011). The theory groups all the related cost like purchase price of the fixed assets, licensing fees, remunerations of related staff, R&D costs, outsourcing cost, and production cost. All these costs are part of the total cost of generating new knowledge. There is a linear relationship between expenditure on R&D and export of technology products (Rehman, Hysa & Mao, 2020), which is basically the result of new knowledge developed through R&D activities. Thus, our hypothesis would be:

Hypothesis 4. The knowledge would be highly valued on the off chance if it is costlier to generate or acquire.

Development of New Products/Services

New product design and development is always an intricate activity and requires efforts in information processing (Montagna, 2011). Organizations collect new ideas from customers and feedback on their existing products and services (Liu et.al, 2020). It is critical for product design innovation to have remarkable advancement in technology and processes, which is derived from customer feedbacks and customer analysis. (Guo et. al., 2010). The results of the analysis provide insight on customer requirement which leads product quality through improvement in business and production operations. Thus, our hypothesis would be:

Hypothesis 5. The knowledge would be highly valued on the off chance that it assists in developing new products/services.

Improvement in Existing Products/Services

Managers implement process improvement programs and initiatives to respond to the pressure from customers and competitors to bring improvement in products/services, increase the speed and efficiency and reduce errors (Collin & Browning, 2019). According to Lee and Kang (2007) product improvement means increase in product functionality. Basically, it is a considered exertion to enhance product use-ability. Customer/consumer feedbacks, competitor and industry analysis provides leads improvement in the existing products/services. As an example, in one of the manufacturing concerns, the customer feedback led to enhancement in the functionality of submersible water pumps through improvement in its design and machining process (Dzissah & Alexander, 1997). Thus, our hypothesis would be:

Hypothesis 6. The knowledge would be highly valued on the off chance if it brings improvement in existing products/services.

Research Design

The researcher used field survey on convenient sample to test the six hypotheses. A questionnaire instrument was used to test the six constructs empirically. Several assessment techniques were used to check and improve the reliability and enhance the validity of the measure. A three-point likert scale questionnaire with 'Agree', 'Neither Agree nor Disagree'(NAND), and 'Disagree' was decided after seven pre-tests and incorporating feedbacks received from industry experts and academicians. With a test-retest score of 0.968 and 0.898 score for Cronbach's alpha analysis, the instrument was found measuring the same construct thus considered reliable. A sample comprising of 521 respondents minimalized the possibility of Type I (α) and Type II (β) errors. The respondents in the sample were the professionals having responsibility related to knowledge management working in the manufacturing industry only. They were 126 out of a total of 521 respondents. They all had received advanced level of management trainings.

Research Methodology

Majority of the respondents (approximately 76.7%) validated the relationship of each item with the corresponding construct. Only, 6.9% of the respondents did not validate the relationship and 16.4% remained neutral. Therefore, in totality, there seems to be a relationship between each element with the value of knowledge.

Quantitatively, the results depict that respondents have validated most of the items as an influence on the VoK, thus cementing the belief that the identified constructs exert significant impact on the VoK (Table-1), thus proves all the hypotheses. However, at the item level, we have some mixed results. On construct no. 4 (Cost of Generating New Knowledge) there are

two items. This construct is related with the R&D activities in the organization. And not all organizations are having R&D in their setup, therefore their employees are not acquainting with the R&D importance for the value of knowledge. For the item 7, there are 45.62% of respondents agreed with the concept and linkage of value of knowledge with the item. And on item 8, only 37.90% agreed with the concept and linkage of value of knowledge with the statement of the item. This less then 50% response is due the fact that most of the respondents were not directly involved in actual research and development activities however they are professionals having responsibilities related to management of the knowledge in their respective industry. The total of two items is 41.76% for Agree which is still higher than the total of Dis-Agree which is only 24.49%. Therefore, we cannot rule out the two items and their construct. This leads us to revise our initial grouping of items for the formation of variables and constructs. Using the varimax rotation for factor analysis at the item level, a more logical and rational regrouping was developed.

Table-1
Frequency Analysis Showing Responses on each Item and Construct

Construct	Item No.	Item	Agree	NAND	Disagree
1. Comp-Adv Agree:89.02% NAND:9.75% DA:1.22%	1	A knowledge that gives competitive advantage to the organization will be valued high.	96.77%	3.22%	0.00%
	2	Competitive advantage provided by the use of knowledge is an element in valuing knowledge.	81.14%	16.39%	2.45%
2. Intellectual Capital (I-C) Agree:68.54% NAND:23.79% DA:7.66%	3	If a knowledge enhances I-C of an individual, it will be highly valued.	79.83%	16.12%	4.03%
	4	If a knowledge augments individuals' productivity it will be highly valued.	57.25%	31.45%	11.29%
3. Business Process Improvement Agree:90.80% NAND:6.40% DA:2.80%	5	If the knowledge increases the efficiency of the business process it will be highly valued.	91.12%	5.64%	3.22%
	6	If the knowledge increases the productivity of the business process it will be highly valued.	90.47%	7.14%	2.38%
4. Cost of Generating New Knowledge Agree:41.76% NAND:33.73% DA:24.49%	7	If high valued infrastructure and facilities were used in R&D, then the knowledge developed would be valued high.	37.90%	3.52%	19.20%
	8	If the cost incurred in the R&D activities were high, the knowledge developed would be valued high.	37.90%	32.25%	29.83%
5. Development of New Products/Services Agree:87.14% NAND:11.24% DA:1.60%	9	The knowledge would be highly valued if it assists in designing & developing new products or services.	87.20%	10.40%	2.40%
	10	If a knowledge develops innovative methods of developing products/services then that knowledge would be valued high.	87.09%	12.08%	0.80%

6. Improvement in Existing Products/Services Agree:82.73% NAND:13.65% DA:3.61%	11	The knowledge would be highly valued if it assists in improving products.	81.74%	14.28%	3.96%
	12	The knowledge would be highly valued if it helps in identifying areas of improvement in the products.	83.74%	13.00%	3.25%

NAND: Neither Agree nor Disagree

Result

Validity and Reliability of Measuring Instrument.

The results of Standard Deviation (σ) analysis on each item were $0.20 < \sigma < 0.90$. This is an indication that each item comprehensively covers the concept. All the items have a mean value between 1 and 2.5, this means that all the respondents agree with the relationship stated in each item. With the alpha (α) value = 0.05, degree of freedom (df) value = 2, the Chi-Squared ($\chi 2$) values are greater than 5.991. The Kaiser-Meyer-Olkin (KMO) Measure of sampling adequacy value = 0.772 (higher than 0.50) and Bartlett's test of Sphericity had the Sig value = 0.000 (less than 0.05), an indication of data suitable structure detection through factor analysis. To establish the validity of content of the survey instrument used, the questions were the same asked during the interviews with the professionals. Each item was discussed in detail with professionals from industry and also with academicians. The outcome of the discussion with the industry experts and academicians conformed the face validity and criterion validity of all the items in the instrument. Multi item construct (each element was evaluated with two items) was used, therefore item analysis and element analysis were also conducted to validate the scales.

Convergent Validity Analysis

To analyse convergent validity, correlation of item-to-total was calculated and checked. The results showed that the convergent validity values were equal to or less than 0.49, confirming that the items are not related to each other and are evaluating different concepts. Only one item has convergent validity of more than 0.5, since the other item in the same element has less than 0.5, therefore it can be neglected. The Inter-Item correlation was found to be between -0.147 and 0.495 indicating that the items are not related to each other and are measuring unique concepts. The Variance Inflation Factor (VIF) values were less than 2.4, an indication of low collinearity among the items, and a tolerance value greater than 0.45 an indication of low multicollinearity in the model. This indicates the suitability of the data for further study.

Discriminant Validity Analysis

From the results of frequency analysis, it is evident that our data is following normal assumptions, therefore it is appropriate to apply discriminant analysis. Discriminant analysis allows us to determine the probability of the item members based on predictable variables. The values of Log Determinants were -7.20, -5.17, and -6.99, very close to each other shows the high confidence in the instrument. The Box's M Test Result has a significance level of 0.000 indicates the rejection of the null hypothesis. Similarly, the significance values in Wilks Lambda are all 0.000, an indication that the group of items predicts statistically significant and the model is strong. And finally, the classification result states that 73.8% of original grouped cases correctly classified which is way above the 50% threshold. With the above results, the authors believes that the data is suitable for dimensionality reduction factor analysis (principal components) using varimax rotation on each item.

PLUM Ordinal Regression Analyses

The -2log likelihood values determines the strength of the model at a significance level (α) of 0.000. The Pseudo R-Square (Pseudo R2) values for Cox and Snell (R2c&s) = 0.480, Nagelkerke (R2N) = 0.819, and McFadden(R2McF) = 0.741. The higher values of Pseudo R2 is the indication for the model proposed in the study appropriate to the data already collected.

Principal Component Factor Analysis

In social sciences, when items are somehow related to each other, Principal Component factor analysis are used with the Direct Oblimin technique to perform dimension reduction procedure. The correlation values remained between -0.150 and +0.449, an indication of lack of any significant correlation among the concepts present in each item (Table 2). Except for item number 2, all the items have Communality value greater than 0.50, therefore they all were considered for analysis (Table 3).

Table 2
Correlation Among the Variables

	VAR_1	VAR_2	VAR_3	VAR_4	VAR_5	VAR_6	VAR_7	VAR_8	VAR_9	VAR_10	VAR_11	VAR_12
VAR_1	1.000	.151	.034	.033	-.048	.223	-.013	-.058	.393	.242	.061	-.061
VAR_2	.151	1.000	.038	.035	-.052	.129	-.096	-.064	.181	.130	.235	.051
VAR_3	.034	.038	1.000	.354	.073	-.051	.047	.024	-.067	.074	.179	.260
VAR_4	.033	.035	.354	1.000	.170	.052	.056	.056	.004	-.101	.194	.096
VAR_5	-.048	-.052	.073	.170	1.000	.326	-.061	-.010	-.106	.238	-.022	.306
VAR_6	.223	.129	-.051	.052	.326	1.000	-.064	-.010	.311	.130	.390	.267
VAR_7	-.013	-.096	.047	.056	-.061	-.064	1.000	.449	-.126	.163	.040	.076
VAR_8	-.058	-.064	.024	.056	-.010	-.010	.449	1.000	-.098	.167	-.079	.020
VAR_9	.393	.181	-.067	.004	-.106	.311	-.126	-.098	1.000	.268	.306	-.074
VAR_10	.242	.130	.074	-.101	.238	.130	.163	.167	.268	1.000	-.150	.346
VAR_11	.061	.235	.179	.194	-.022	.390	.040	-.079	.306	-.150	1.000	.412
VAR_12	-.061	.051	.260	.096	.306	.267	.076	.020	-.074	.346	.412	1.000

Table 3
Communalities among the Variables

	INITIAL	EXTRACTION
VAR_1	1.000	.635
VAR_2	1.000	.268
VAR_3	1.000	.712
VAR_4	1.000	.604
VAR_5	1.000	.706
VAR_6	1.000	.652
VAR_7	1.000	.733
VAR_8	1.000	.669
VAR_9	1.000	.680
VAR_10	1.000	.797
VAR_11	1.000	.874
VAR_12	1.000	.667

Extraction Method: Principal Component Analysis.

Using the Direct Oblimin method for extraction, only five components have Eigenvalues greater than 1.00 and their total cumulative is 66.637%. The five components finalized were loaded. Out of the five, components 1, 2, and 5 had two loadings, and component 3 and 4 had three or more than three loadings of items (table 5: Structure Matrix). Therefore, we will consider only components 3 and 4.

Table 4
Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	2.287	19.061	19.061	2.287	19.061	19.061	1.720
2	1.778	14.815	33.876	1.778	14.815	33.876	1.575
3	1.520	12.664	46.540	1.520	12.664	46.540	1.820
4	1.316	10.966	57.506	1.316	10.966	57.506	1.711
5	1.096	9.131	66.637	1.096	9.131	66.637	1.491
6	.973	8.108	74.745				
7	.826	6.880	81.625				
8	.618	5.152	86.777				
9	.559	4.662	91.439				
10	.473	3.945	95.384				
11	.372	3.097	98.481				
12	.182	1.519	100.000				

Extraction Method: Principal Component Analysis.

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Table 5
Values of Structure Matrix Analysis

	Components				
	1	2	3 Strategic Advantage	4 Core Capabilities	5
VAR1 A knowledge that gives Comp-Adv to the organization will be valued high.			.782		
VAR2 Comp-Adv gained by the knowledge is an element for valuing knowledge.			.429		
VAR3 The knowledge will be valued high when it enhances and individual intellectually.					.835
VAR4 If knowledge augments in individuals' productivity, it will be valued high.					.773
VAR5 If knowledge increases the efficiency of a business process, it will be valued high.				-.805	
VAR6 If knowledge increases the productivity of a business process, it will be valued high.	.620				
VAR7 If high valued infrastructure and facilities were used in R&D, then the knowledge developed would be valued high.		.847			
VAR8 If the cost incurred in the R&D activities were high, the knowledge developed would be valued high.		.817			
VAR9 The knowledge will be valued high if it assists in designing & developing innovative products and services.			.779		
VAR10 If new knowledge develops innovative methods of developing products/services then that knowledge would be valued high.				-.623	
VAR11 The knowledge will be valued high when it helps in improving existing products and services.	.920				
VAR12 The knowledge will be valued high when it helps in identifying areas of improvement in the existing products.				-.663	

Extraction Method: Factor Analysis (Principal Component) using Oblimin with Kaiser Rotation Method.

In the light of the above results, two new variables were structured, covering the concepts present in each item. They are:

Strategic Advantage:

This newly developed variable is based on the understanding that if knowledge provides a competitive advantage to the organization, then that knowledge would be valuable to the organization. The organization can get some benefit from the knowledge by using it for creating

innovative products/services. In other words, if the innovative product/service provides a strategic advantage over the competitors, then the knowledge which is used to develop the innovative product/service would be valued high. Likewise, the strategic advantage is an element that has certain influence on the VoK and could be an instrument in determining the VoK.

Core Capabilities:

The second newly developed variable is based on the understanding of the internal strengths of the organization which is known as an internal core capability. The core capability enables the organization to bring continuous improvement in its business process to enhance the efficiency of operations. An efficient operation containing R&D function would be capable to bring innovation in organizations' processes, products, and services. It can also bring improvements to the existing products/services. Therefore, an organization can have a core capability of enhancing business process efficiency, improving existing products/services, and bring innovation to the processes, products, and services. The knowledge which can provide this sort of core capability would be valued high in the organization and therefore, core capability can be an instrument to determine the value of knowledge.

Finding and interpretation

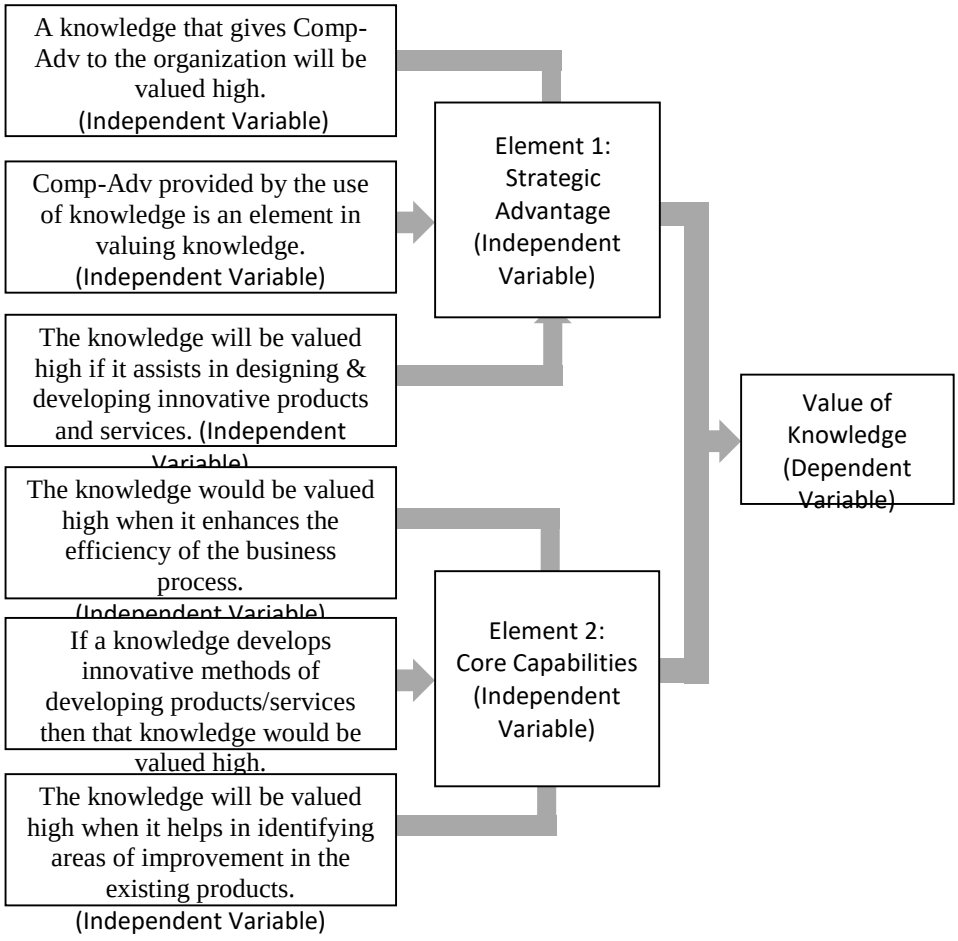
Items in the survey instrument found relevant for valuing tangible assets are not as important in the case of valuing knowledge. Some has more impact on the value of knowledge and some has little less. For example, Competitive Advantage, New products/Services, Business Process Improvement, Innovation, and Improvements in Products/services are important and have a significant impact on the value of knowledge. However, an increase in productivity, R&D infrastructure, Cost of R&D, Intellectual capital, and individual productivity was found least important in impacting on valuing knowledge.

Discussion

The principal component factor analysis converged all the items conceptually into two new elements, “Strategic Advantage” and “Core Capabilities” that have an effect on the VoK. The “Strategic Advantage” composed of all the items that were found essential for an organization in attaining the competitive advantage over the competition. In most cases, an organization has acquired this status through innovation in products or its services. Innovation is a result of a continuous process of knowledge development which in turn brings innovation. We gain new knowledge through research and innovation. Knowledge encourages further research and new forms of innovation which in turn develop new knowledge or advances existing knowledge. However, not every innovation leads to development of new knowledge. Results of innovation

that can be applied across multiple area of study creates theory and knowledge. Innovation is a broad concept, it can be applied in processes, structures, outcomes, antecedents, and in behaviours at the national, organizational, professional, and individual levels. Since behaviour is dependent on knowledge, it brings improvements in business processes. Thus, the efficiency of the business process improves and the existing products/services produced are improved. It takes time and effort to acquire knowledge. The personal gains from knowledge such as traits, skills, intelligence, problem-solving, confidence, innovation, and open-mindedness are judged by the amount of knowledge being acquired. Therefore, the "Core Capability to R&D" has a critical role in impacting the VoK. Figure 1 shows the framework for valuing knowledge. The two elements, Strategic Advantage, and Core Capabilities are shown with their items.

Figure 1
Framework for Valuing Knowledge



Limitations and Future Direction

Limitations of this study gives some opportunities for further research. First, the current research is basically a cross-sectional study. It is recommended that a longitudinal research study overtime to be made to check the changes in the VoK by the effects of these factors. Next, the respondents of this study were the professionals working in Pakistan, we suggest

similar study be taken on organizations in other parts of the world to check the applicability of the findings across the globe. Also, the respondents were from the manufacturing industry, a similar study can be made in the service industry and commercial sector. Another potential research opportunity that can augment this study would be the identification of relationships between each item to gauge the influence of one element on the other. This could assist in developing a comprehensive equation for determining the VoK.

Conclusion

This study presented two elements of valuing knowledge: Strategic Advantage and Core Capabilities. Both the elements encompass the 12 items/factors identified initially for determining the VoK. The findings will be helpful in developing better management of knowledge and determining its value. Second, since knowledge is now considered one of the most important as well as critical asset/resource in the organization, the decision makers would now be able to find the reasons for the change in the worth of their organization. This will assist professionals to take appropriate measures for maintaining their competitive position. Third, by developing further on this model, value of newly developed/acquired knowledge can be estimated. Fourth, since organizations are knowledge depositories, this model can help managers to classify the knowledge resource into two elements for its management. For example, knowledge linked to Core Capabilities needs to be safeguarded as they are the reason for strategic advantage and can be used with little efforts by the competitors. On the other hand, knowledge linked to business process improvement is more related to the industry as the basic model of all the companies in the industry follows almost the same business model. Not all employees are the user of each knowledge therefore access to a body of knowledge be systematized. Some knowledge would be specific to a firm and needs confidentiality measures to protect from competitors. A body of knowledge about some improvement in existing products shall be shared with all the concerned employees of related departments across the organization to gain valuable feedback and suggestions.

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