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# Knowledge Management Trends in the Digital Economy Age

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## 1 Introduction

The Age of Digital Economy can be described as encompassing and revolutionizing phenomenon fueled by the convergence of advancements in human communication, computing (computers, software, services) and content (publishing, entertainment and information providers), to create the interactive multimedia and the information highway [24]. This new age is gradually forcing us to rethink the way we perceive the traditional definitions of economy, wealth creation, business organizations and other institutional structures.

The paper focuses on the main areas of knowledge management under the new economy conditions. The empirical study of several Russian companies shows the need for strong progressive leadership who is responsible for the transformation in the company.

The paper studies the communication and networking of employees and managers to combine their knowledge and creativity in the KM framework.

## 2 Theoretical background

### 2.1 Knowledge management: brief overview

For the purpose of this study we define knowledge as a set of information valuable for the organization that is embedded in its employees or any of the production processes, systems and organizational culture [3]. This definition includes the knowledge and individual skills, norms

and value systems, databases, methodologies, software and production experience.

In the literature, there are several knowledge classifications:

- Classification of knowledge based on the content ("knowledge why", "knowledge what", "knowledge how", " knowledge where " [15]),
- Classification based on belonging (to the person or the team [17]), and other criteria.

These classifications could be supplemented by a taxonomy made by [8].

Many authors consider knowledge management as a system determined by organizational, human and technological components (e.g. [15]).

- Organizational knowledge includes principles, skills, routines that provide business activities.
- The human component includes "social capital" of employees, an atmosphere of trust and cooperation that promotes knowledge exchange.
- The technological component that complements KM with IT tools is quite often the most obvious area of investment in KM [2].

However, the focus on investments in technological components may have detrimental impact on the successful solution of more difficult organizational problems [14]. Many authors (e.g. [6]) consider KM in the context of the enterprise management system. KM serves as a "bridge" between the external information management processes (from customers, suppliers, competitors) and internal information management processes (e.g., R&D, marketing, management, and finance).

## **2.2 Knowledge management processes and functions**

In the field of KM there was developed a line of models related to corresponding organizational processes. The authors identify key knowledge management processes. Comparative analysis of these models uncovers the variety of knowledge management processes combinations. For example, the inventor of the term "knowledge management" Karl Wiig classifies these processes into 4 types: building knowledge, holding knowledge, pooling knowledge, using knowledge [28].

As part of knowledge building, knowledge in the organization is acquired, analyzed, renewed, structured and codified. The process of

knowledge holding includes keeping knowledge in the archives and embedding it in the existing processes and procedures. Knowledge pooling includes search of new knowledge, coordination and combination with existing knowledge. Knowledge using relates to the analysis of the problem or situation, identification of knowledge useful in this situation, and choosing among the alternative solutions to the problem.

Other authors propose similar classifications. For example, [27] distinguish 4 processes:

1. New knowledge is developed.
2. Knowledge is distributed to those who need it.
3. Knowledge is made accessible both for future use and for use by the whole organisation.
4. Knowledge areas are combined.

T. Davenport and L. Prusak describe processes of knowledge generation, codification, distribution and saving [5].

At large extent existing descriptions repeat, detalize or complement each other. For instance, knowledge building [28] includes knowledge generation and codification [5]; knowledge distribution [27] includes knowledge pooling [28], and transfer [5]; while four phases of knowledge spiral represent more abstract description of knowledge sharing, integration and creation.

However, the main assumptions lying in the foundation of the majority of the models have limitations [2; 20]. A number of knowledge process models focuses on knowledge codification, storing and reuse [28; 27; 14]. Particularly, identification of these components (codification, archiving, storing and reuse) is caused by the perception of knowledge management as a function of systematization of already existing knowledge.

Currently companies get competitive advantage not due to existing knowledge systematization and reuse, but due to higher level of absorptive capacity, learning capability and new knowledge creation [29; 10; 25]. In this context, codification and storing of knowledge represent basic supportive functions of KM, but they should not be regarded as key KM functions [1; 20].

Partly solving above-mentioned concerns is knowledge creation model by I. Nonaka [16]. This model highlights the dynamic aspect of knowledge creation as an ultimate goal of the company. According to Nonaka, knowledge creation is not a separate phase, function or process, but sophisticated concept describing the company's activities in

general, targeted at innovation building. The key prerequisite of new knowledge creation are knowledge sharing processes between individuals (socialization) and knowledge transfer in the organization (externalization and internalization).

One of the ways to implement systemic thinking principles in order to build a holistic picture of organization. In the context of KM, systemic thinking means that all elements of the system as well as the system in general are considered: people, valuable knowledge, knowledge sharing culture (or its absence), organizational strategy, technological infrastructure.

### **2.3 Knowledge life cycle working model**

Cyclical models of KM systems functioning have an iterative character as well as the actual process of KM system creation. Besides, lifecycle models embed the systemic thinking principles reflecting the variety of internal processes of the organization. This is especially important for KM system. That is why it is important to look at the knowledge life cycle as a whole.

On the other hand, lifecycle models have some disadvantages. Firstly, these models usually have prescriptive nature as they prescribe what kind of KM system should be but do not mention the details. Secondly, lifecycle models do not consider the degree of correspondence of KM system to the organizational strategy or cultural context [18].

Lifecycle model developed by Bukowitz and Williams [1999] represents the detailed model of working with intellectual and knowledge assets in the organization.

The model consists of 7 stages:

- 1 Get: Access and filter information to identify relevant and valuable content
- 2 Use: Combine information in unique ways to enhance and support innovation
- 3 Learn: Discovery of information in order to apply content based on experience and organizational memory
- 4 Contribute: Participants share their knowledge and offer their comments into a shared space or 'repository' to assist and develop the overall community or organization

5    Assess:            Evaluation of knowledge acquisition and use of the organization in the form of intellectual capital

6    Build/Sustain: Plan and allocate resources to support the attainment of future knowledge for the organization

7    Divest Evaluate: “assets” which do not create value for the organization and allocate the associated resources elsewhere.

The authors highlight that the first four model stages (Get, Use, Learn, Contribute) focus on tactical issues, while the last three (Assess, Build/Sustain, Divest) have more strategic nature.

Overall, organizational knowledge management has been characterized as consisting of three overlapping processes: knowledge creation, knowledge codification, and knowledge. Knowledge is said to be one of the key assets of an organization. Knowledge is not evenly distributed in organizations, and therefore efficient information systems (ISs) are needed to enable timely and effective knowledge flows.

### **3       Research methodology**

#### **3.1 Knowledge maturity measurement**

Measuring KM effectiveness is a difficult task because of intangible nature of knowledge assets. There are several approaches towards corporate KM maturity estimation. For example, Balanced Scorecard methodology of Kaplan and Norton (The Balance Scorecard, 1996), is adapted for KM. Other inductive and deductive methods are proposed in [19; 22; 23]. Another example is [11] where authors propose mechanism for KM evaluation including estimation of mental, cognitive, process, technology and institutional levels. One of the limitations of this methodology implementation is difficulty of the measurement process and evaluation criteria choice.

The survey was developed on the base of the PricewaterhouseCoopers [3] survey. Our express-survey estimates effectiveness of the KM system of the company through additive maturity scale.

In order to estimate KM maturity of the company we adapted the survey proposed by Bukowitz and Williams consisting of 140 questions (20 questions for each life cycle stage). We analyzed the questions of five stages included in the theoretical model. In reliance on the results of in-depth interviews and after careful analysis of the survey questions (the questions were translated from English, particularized and simpli-

fied) we selected 18 questions measured by 3-point Likert scale: 2 points – Strongly agree, 1– Neither, 0 – Strongly disagree.

Hence the maximum score was 36 points. Based on the results, the average score was 17 points.

### **3.2 Internal and external factors influencing KM system**

Apart from the questions related to KM, other questions on respondents' internal factors were added:

- Company size;
- Company age;
- Geographical location.

The size of the organization is the factor that can influence the intensity of knowledge sharing, and in the majority of empirical studies this factor is included as a control variable. In most cases it is assumed that the lesser the size of the firm, the more intensive is knowledge sharing as the employees could communicate more frequently. However the results of empirical studies are controversial: some authors found negative effects [13], positive effects [12], and non-significant effects [26].

The company's age is one of the KM determinants: the more senior the organization or the division, the higher its "organizational inertia" and the less its abilities to learn and to adapt for changing environment [4]. A number of academic papers demonstrated that the more immature firms have various advantages related to knowledge sharing and other knowledge management processes [7].

Geographical location is another factor affecting knowledge management, as proximity to the major cities correlates to intellectual capital level of the region. Of course, the socio-economic context could play a large role in intellectual capital formation of the organizations [21].

### **3.3 Research questions**

Knowledge management (KM) is the process of capturing the value from the knowledge assets and intellectual capital of the organization. Knowledge and effective knowledge management could be a source of competitive advantage. However, due to intangible nature of knowledge resources managers and academics struggle to evaluate and finally manage these resources of the company.

The main objective of this paper is to understand and describe how knowledge management practices are organized in Russian firms of different industries and the extent to which these practices have been adopted to support the business strategy. Based on a qualitative study of 100 Russian managers from different firms, this study highlights the specific combinations of KM practices and accents made by Russian managers in this area.

This paper investigates the extent to which KM practices have been adopted by Russian firms to gain competitive advantage. Specifically, we address the following research questions:

1. Are firms using KM initiatives strategically to support the business strategy? If so, what are the major KM initiatives these companies adopt?
2. What may be the major problems and areas for improvement if KM practices are to play a more significant role in supporting the business strategy for firms to gain competitive advantage?

### **3.4 Sample and data collection method**

The survey was conducted on a sample of EMBA (Executive Master of Business Administration) program students and alumni at Graduate School of Management in St. Petersburg during 2010-2015. One of the program enrollment conditions is having at least 5 years of managerial experience. Based on the results of the survey, the majority of the respondents represent large companies that are based in St. Petersburg and Moscow.

We conducted the cluster analysis to identify similar groups of companies from the point of KM practices used. These practices are measured by three-point scale presenting the degree of active usage.

Because this study is of an exploratory nature, however, we feel that the number and spread of the cases we obtained are sufficient to provide information needed for this paper's discussion.



## 4 Discussion of the results

### 4.1 Descriptive statistics

In order to identify the differences between high and low performing in KM organizations we divided the sample in three groups based on their total survey score: top quarter, low quarter, and the remaining companies.

The average score is 17 points. The top quarter of total score distribution has 22-36 points, the bottom quarter of total score distribution comprised the group companies with 0-10 points. The remaining companies were grouped under “middle half” label. The groups’ descriptive statistics is described in table 1.

*Table 1. Score distribution within the groups*

	Number of respondents	Min. score, points	Max. score	Average score
<b>Top quarter</b>	26	23	35	26,46
<b>Middle half</b>	55	11	22	16,67
<b>Low quarter</b>	23	4	10	8,30
<b>Total</b>	104			

Therefore among the “top quarter” group members there is a noticeable prevalence of large companies. For “middle half” group, large and medium size companies are prevailing. “Low quarter” group is comprised mostly by small enterprises.

The majority of respondents indicated that their organizations were founded during last 15 years. The “top quarter” group was comprised mostly from equal number of the organizations from various ages. In the “middle half” group young companies are prevailing. In the “low quarter” group there is only one company founded before 1990.

Besides, we determined the average estimations for KM characteristics in Russian companies of different size, age, and geographic location (Table 2).

*Table 2. KM practices in Russian companies of different size, age, and geographic location*

No.	Factor	Index	Characteristics of corresponding criteria			Kruskal-Wallis criteria*
1	Size of organization	<i>Groups</i>	<i>Less than 50 empl.</i>	<i>50 - 150 empl.</i>	<i>More than 150 empl.</i>	0,58
		Average value	16,53	14,40	17,63	
		Number of observations	19	5	64	
2	Age of organization	<i>Groups</i>	<i>1-9 years</i>	<i>10-17 years</i>	<i>18-24 years</i>	0,94
		Average value	18,06	17,43	17,71	
		Number of observations	18	21	16	
3	Geographical location	<i>Groups</i>	<i>Moscow and St. Petersburg</i>		<i>Regions</i>	0,58
		Average value	17,89		19,21	
		Number	45		14	

		of observations		
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Kruskal-Wallis criteria showed no statistical differences among the groups based on size ( $p = 0,58$ ), age ( $p = 0,94$ ), and geographical location ( $p = 0,58$ ).

#### 4.2 Cluster analysis

Based on the KM practices used we were able to get 6 different groups (clusters) of companies with measures of the maturity of KM system within these companies.

Overall, all groups of companies have very low indicators of KM system ranging from 11 to 25 points (out of 54 or 18 questions by 3 points each). But even within this low total score we are able to explore the combinations of practices used so as to show what are the real problems and biases Russian firms have.

The first group represents the majority of Russian companies ( $n=38$ ) and scored very low on KM initiatives used ( $KM = 11$  out of 54). This is the lowest result within the largest group with major emphasis on creating necessary KM infrastructure. Investing heavily in databases and ignoring other aspects of KM is by far the most widespread bias in KM initiatives implementation.

The second cluster has a substantial share of companies ( $n=29$ ) and has the highest score among other companies ( $KM = 25$ ), although the score itself is just half of the maximum level of 54 points. These companies pay attention to all aspects of KM in some way, but overlook the “learning perspective”, with no particular attention to benchmarking, learning by reflexion and implementing redundancy in job design.

The third cluster of companies ( $n=19$ ) is in the middle between the first and the second clusters with the score of 19 points. It is characterized by some developments in KM infrastructure, knowledge sharing, learning and alliances. However, these companies do not have job positions in charge of KM processes, and KM initiatives do not involve all employees. This is the typical situation when KM initiatives are

launched by top-managers without support by middle-line managers and specialists.

The next three clusters are outliers from the point of their quantity. They are characterized by above average KM performance.

The fourth cluster (n=7) has the moderate score of 21 points and is characterized by good developments in KM infrastructure, knowledge sharing and learning (learning organization creation). Main areas for improvement are related to positions responsible for KM, alliances and involving all employees in KM initiatives. The situation repeats the third cluster when top-management is actively involved in KM development overlooking the need to cover employees of all levels.

The fifth cluster (n=5) with lower score (19 points) focuses on creating job positions in charge of KM processes but does not have well-developed infrastructure, learning orientation. The knowledge sharing system is developing to some extent. Organizational culture supports employees' initiatives but, again, does not involve all employees in the process of KM. From this point of view this cluster is similar to the fourth one.

The sixth cluster (n=1) with the second highest score of 23 has employees responsible for KM and relevant organizational culture. However, it lacks the appropriate infrastructure. The systems of knowledge sharing, alliances and learning have controversial results.

## **5 Conclusions**

The present research is aimed at identifying the specific characteristics of knowledge management system in Russian companies. The results demonstrated that size, age, and geographic location do not influence the maturity of KM systems in Russian companies.

Descriptive analysis demonstrated that many respondents note high level of top-management support as well as high level of IT as KM tools. This result could be explained by the fact that the majority of respondents consider top-management as an important issue of KM dissemination and development.

Cluster analysis demonstrated that the majority of respondents understood the importance of IT support for all the KM processes. However, this bias could lead to the overall low level of KM maturity.

Second large cluster of companies already has good KM base, but is lacking the strategic goals for KM development. Another problematic point is engagement of all employees in the process of knowledge sharing. Overall, cluster structure of KM practices in Russian companies reflects the internal logic of knowledge management trends with too much emphasis to IT infrastructure at the lower levels of KM maturity.

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