# The Knowledge Managment Capability of High-Technology Enterprises

Evgeniya Gorlacheva[1], Alexander Gudkov[2], Dmitrij Koznov[3] and Irina Omelchenko[1]
[1]*Industrial Logistics Department, Bauman Moscow State Technical University, 2-nd Baumanskaya,5, 105005, Moscow, Russia*
[2]*Instrument Technologies Department, Bauman Moscow State Technical University, 2-nd Baumanskaya,5, 105005, Moscow, Russia*
[3]*Software Engineering Department, Saint Petersburg State University, Bibliotechnaya sq., 2, 199034, Saint Petersburg, Russia*

Keywords: Knowledge Management Capability, High-Technology Engineering Enterprises, Competitive Advantage.

Abstract: Improving the knowledge management (KM) capability in order to gain sustainable competitive advantages has emerged as an important strategy for addressing recurring problems in a new product development such a long time-to-market, riskiness and high development costs. Synthesizing prior theoretical research in innovation management, competitive advantages, KM and practical activities of high-technology engineering enterprises it is posited that innovation, engineering processes and organizational culture are important antecedents of KM capability. However, it is vague whether the KM capability as a mediator affects competitive advantages. The aim of the paper is to explore the impact of the KM capability in high-technology engineering enterprises. To achieve this aim we have contributed an empiric research in which 50 high-technology engineering enterprises of Russia were involved. The regression analysis is applied to analyze the obtained empiric data. Among the three selected antecedents the engineering processes have the most impact on the KM capability. The research hasn't proved the mediating role between the KM capability and competitive advantages because of relative novelty of this phenomenon to Russian high-technology enterprises.

## 1 INTRODUCTION

In order to survive in a business environment high-technology engineering enterprises have to gain and support sustainable competitive advantages. There is a large variety of ways to be competitive: by means of product innovation (Pisano, 1997), by various organizational technologies (Crossan, et al., 1999), by sophisticated IT-infrastructure (Sabherwal, 2005), etc.

It should be noted that the relatively essentiality of the high-technology engineering enterprises competitive factors have remarkably changed. Knowledge has become the core element that takes an important place and considers as the main mode of competition (Eisenhardt, Santos, 2002). If in prior literature the problem of competitive advantages is considered in framework of resource-based view, nowadays there has been a paradigm shift to knowledge-based perspective (Alavi, Leidner, 2001).

According to knowledge-based view the high-technology engineering enterprise can be seen as a knowledge-integration institution which integrates individual or group. The core of knowledge-based view lies in its attempt "to understand the organizational capabilities through which the enterprises access and utilized the knowledge possessed by their employees" (Grant, 1996).

Academics and practitioners have recognized the importance of the Knowledge Management (KM) capability for an enterprise's competitive advantages (Daneels, 2000). Empirically the KM capability has been found to improve competitive advantages. Reviewed empiric research (Frishamar et al., 2012) on the KM capability has largely established the relationship between various enterprise domains (intellectual capital, organizational culture, innovation) and enterprise's competitive advantages.

Gorlacheva E., Gudkov A., Koznov D. and Omelchenko I.
The Knowledge Managment Capability of High-Technology Enterprises.
DOI: 10.5220/0006497101310138
In *Proceedings of the 9th International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management (KMIS 2017)*, pages 131-138
ISBN: 978-989-758-273-8

However this stream of research has not covered such core domains as innovation, engineering processes and organizational culture, and hasn't considered a mediating role of the KM capability. There is also a lack of empiric data that confirm the relationship between innovation, engineering processes, organizational culture and the KM capability namely in high-technology engineering enterprises.

This paper aims to examine and empirically test the relationship between the aforementioned antecedents' impact on the KM capability and a mediating role of the KM capability. For that purpose the survey of 50 high-technology enterprises has been conducted. The investigated enterprises were mainly from machine building complex, IT-sphere and biotechnology. The procedure of the research has based on the following parameters: innovation, engineering processes and organizational culture, the KM capability, competitive advantages, their evaluation and statistical analysis. The regression analysis has been used while analysing given results. The interpretation of results has discovered the major impact of engineering processes to the KM capability. Our expectations about KM capability as a mediator haven't been statistically proved.

# 2 BACKGROUND

## 2.1 The KM Capability in KM Framework

From knowledge management framework high-technology engineering enterprises should possess a set of organizational capabilities that allows achieving the desired outcomes (Lager and Hoerte, 2002). The KM capability is among them as the most crucial one.

The research conducted by (Gold et al., 2001) the link between organizational effectiveness and the KM capability has been found. Our aim is to test empirically whether KM capability impacts directly on competitive advantages in high-technology engineering enterprises.

## 2.2 Key Antecedents of the KM Capability

### 2.2.1 Innovation

The main activity of high-technology engineering enterprises is a new product development. This activity is associated with risks and uncertainty. The literature review (Gudkov, 2016) shows that there are four types of a new product:

- Totally new product (innovation);
- Modified existing product (modification);
- Enlargement of a product (differentiation);
- Spread of a trade mark (diversification).

It is also highlighted that a new product development process involves the acquisition, dissemination and use of new and existing knowledge. Thus we could recapitulate that innovation contributes to the KM capability. A new product development often requires new or modified engineering processes.

### 2.2.2 Engineering Processes

The sophistication of engineering processes leads to elaborate them well-tuned and regulated (Gudkov, 2016). Engineering processes should be supported both corresponding management, e.g. product management in software companies (Maglyas et al., 2012), and design-oriented methods such as ontology engineering, system analysis and enterprise architecture management (Gavrilova et al., 2010).

Engineering processes can't exist without appropriate communication and information systems. Taking into consideration that engineering processes generate a lot of data on its every phase, we could suppose that engineering processes enhance the KM capability.

### 2.2.3 Organizational Culture

Organizational culture is another antecedent that enhances the KM capability. In (Pearce C. and Ensley M., 2004) it is highlighted that employee empowerment, team creativity and a shared vision are necessary while elaborating a new product (Popov et al., 2016).

In order to increase the KM capability employees must be given the opportunity to develop and create ideas together. Thus we consider organizational culture as an antecedent factor of the KM capability.

## 2.3 Mediating Role of the KM Capability

The KM capability depends on three core antecedents' relatedness. These arguments suggest that the KM capability mediates the relationship between core antecedents and competitive advantages.

Thus we expect that the KM capability will function as a mediator of the relationship between the core antecedents and competitive advantages.

### 2.4 Regression Analysis

Undoubtedly there is a huge variety of measurement models that can be used by a researcher. Some of them are more reliable, some ones are easier in use.

The regression analysis allows including or excluding predictors (independent variables) until the model would be adequate for research purpose. The embedded method of the partial least square constructs a regression equation in terms of small sample data.

Regression analysis (Drayper, Smith, 2003) reveals the interrelations between dependent and independent variables in statistical research. An independent variable means a variable that is chosen initially to test its impact on a dependent variable. In turn a dependent variable is a variable that is under measurement.

Table 1 and 2 presents the description of evaluation parameters that are commonly used in the regression analysis.

Table 1: Regression analysis' parameters: statistical reliability.

| Parameter | Possible value range | Meaning |
|---|---|---|
| Cronbach α | $0,5>\alpha>1$ | Internal consistency of parameters |
| β-coefficient | $5<\beta<7\%$ | Error of approximation |
| p-value | $0,5<p>0,5$ | Statistical reliability |
| $\chi^2$ | value of calculations depends on sample size | The correctness of null hypothesis |

Table 2: Regression analysis' parameters: statistical significance.

| Parameter | Possible value range | Meaning |
|---|---|---|
| $R^2$ (Pearson coefficient) | $0<R^2>1$ | Interaction detection of model variables |
| Deviance residuals | Depend on calculations | Confirmation of model assumptions |
| Darbin-Watson criterion | $0\leq d\leq 4$ | Confirmation of model significance |

The choice of the best regression model can be conducted by four different methods: 1) method of all possible regression equations; 2) method of the best regression equations; 3) method of exclusion; 4) stepwise regression (Drayper, Smith, 2003).

The latter is more optimal as it allows using resources thrifty.

## 3 RELATED WORKS

The KM capability is surveyed in different works and from different aspects. In (Pfeffer and Souton, 1999) it is pointed out that enterprises tend to pay more attention to knowledge creation and less attention toward utilizing available knowledge.

The other paper (Hsu and Sabherwal, 2011) is considered the KM capability in terms of intellectual capital issues. The main aim of this paper is to provide insights into the mediating roles of knowledge enhancement and knowledge utilization in the relationship between intellectual capital and innovation.

One more paper (Freeze and Kulkarki, 2013) has suggested a KM capability assessment instrument to measure knowledge assets.

In (Dawson, 2000) the KM capability is defined as the effectiveness of an organization to perform knowledge processes using resources of intellectual capital and key information inputs.

In (Gold, Malhotra and Segars, 2001) the KM capability is considered in two key aspects: a knowledge process capability and a knowledge infrastructure capability.

Organizational culture and the KM capability are depicted in various works related to organizational climate (Song, Wang, 2016) or organizational citizenship behaviour (Podsakoff, 2016).

However there is a lack of empiric research that investigates the mediating role of the KM capability between innovation, engineering processes, organizational culture and competitive advantages in high-technology engineering enterprises.

## 4 METHODOLOGY

The study of the KM capability bumps into a set of difficulties due to its multidimensionality (Hsu and Sabherwal, 2011) and qualitative nature (Malhotra et al., 2006).

The papers that study the KM capability one could divide into two large groups: these that propose the elaboration of conceptual frameworks (Frishamar et al., 2012) and those that propose empiric research (Zheng et al., 2010). The latter group is more numerous.

One more difficulty is the choice of robust measurement instruments.

The methodology of this particular research is coincided with the standard procedure, described in (Tokarev, 2013). It comprises the following stages: determination of initial conditions; purpose statement of the research; choice of research type (an empiric or a desk one); choice of research method (a sample size determination, a questionnaire elaboration, a measurement model and its reliability test); analysis of results and findings. The whole scheme is presented on fig.1. The brief description of each stage is presented below.

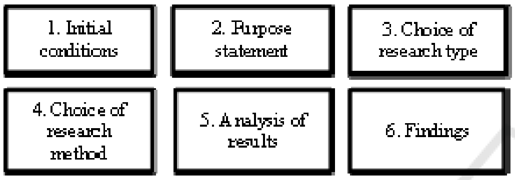


Figure 1: Scheme of the present research.

The analysis of initial conditions allows determining the environment where an enterprise functions and performs its business activities. Purpose statement is the most important stage of the whole research. It determines the configuration of the further work.

The choice of research type strongly depends on time and budget. Despite the fact that desk research is more budgetary, only empiric research gives original information about the real state of art.

However empiric research requires taking in mind many important factors: the determination of sample size; time to answer the questionnaire; the respondents' willingness to answer; the readiness of interviewers to explain "bottle necks", etc.

The elaboration of the questionnaire requires the critical examination of the selected field and the deliberate preparation of all questions. The typical structure of the questionnaire comprises four main parts: introduction, respondent profile, main part and detector questions (Tokarev, 2013; Golubkov, 2008).

The most appropriate statistical approach in determining sample size is the calculation on the confidence interval (Golubkov, 2008).

Findings of the research present the interpretation of the given results and its impact on the purpose statement.

This analysis has allowed elaborating the questionnaire. The whole questionnaire comprises 20 questions that have been adopted from interviews with senior executives and added from existing studies (Frishamar, 2012; Casselman, 2011).

There are four parts included in the questionnaire. Part A mentions about the attitude to innovation and engineering processes organization. Part B deals with the knowledge management and IT-infrastructure elements. Part C presents questions concerning organization culture and procedures of KM whether they are settled in enterprises or not. Part D concerns the profiles of enterprises, its geographic characteristics and respondents' position in an engineering enterprise.

In this particular paper only four questions are presented. We have used a five-point Likert-type scale which ranges from "strongly disagree" (1) to "strongly agree" (5).

Our regression model is based on the five independent and two dependent variables. Each of the independent variable contains at least four items. The items were codified in order to use constructs in SPSS Statistics 22.0 toolset (SPSS Statistics, 2017). Thus, a variable "Innovation" (V1) comprises four items:

- innovation (IN1…5);
- modification (MOD1…5);
- differentiation (DIF1…5);
- diversification (DIV1…5).

A variable "Engineering processes" (V2) includes:

- totally regulated (TReg1…5);
- possible changes to employee's initiative (EmpIn1…5);
- regulated procedures in "control points" (ConPnt1…5);
- dependence on project specification (ProSpf1…5).

A variable "Organizational culture" (V3) comprises:

- knowledge diffusion among employees (KnDif1…5);
- improvement of rationalization (ImpRat1…5);
- increase of trust among employees (IncTr1…5);
- cultivation of "learning organization" values (LrnOrgVl1…5).

All these variables are considered as predictors.

Let's consider dependent variables, which are used in our regression model. The KM capability has been viewed as a dependent variable (V4) and described by following items:

- formalization of management processes (FrMPr1…5);

- diffusion of best practices among employees (BestPr1…5);
- creation of experts' list (ExpLs1…5);
- time decrease of business processes (TiDec1…5).

Due to a mediating role of the KM capability, its variable has been also viewed as a predictor of the dependent variable – variable "Competitive advantages" (V5). The last one was described by the following items:

- custom retention (CusR1…5);
- sales growth (SalGr1...5);
- financial performance (FinPr1…5);
- reputation (Rep1…5).

In (Frishamar, 2012) these items are described more detailed.

The next procedure is the determination of the sample size. The sample size was calculated and should be about 50 enterprises. Confidence figure is evaluated at 85 %, as the KM capability is quite new within the high-technology engineering enterprises in Russia. 70 % of returned questionnaires is quite appropriate according to (Golubkov, 2008).

We used multi regression model to evaluate the variables and find out whether our suppositions concerning the mediating role of the KM capability could be proved by reality.

# 5 RESULTS

## 5.1 Informant and Company Profiles

The present research uses empiric data. According to described methodology, we have studied the initial conditions to clarify whether the notion of the KM capability is familiar for high-technology enterprises.

We selected 50 high-technology engineering enterprises dealing with RandD as a main filed. In December 2016 we received 35 usable questionnaires (70 % of response) from senior executives (31 %) and senior engineering staff (69 %). The respondents had an average 5 years of work experience in these current enterprises. The majority of the respondents are from machine building complex (see fig. 3).

The enterprises of machine building complex contribute substantially to gross domestic product. The age and the size (number of employees) of these enterprises can be considered as established ones. More than half (57,1 %) have been founded more than 50 years ago and 62,8 % have more than 1000 employees (see fig. 4 and fig. 5).

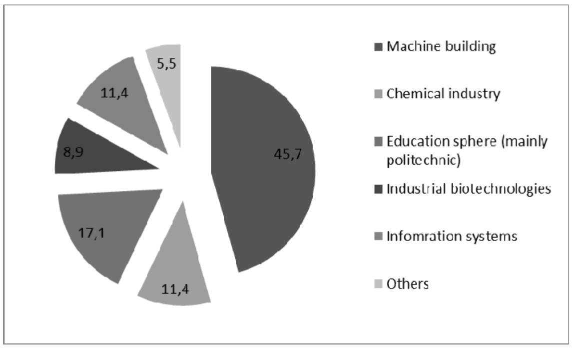


Figure 2: Industrial affiliation of the responded enterprises.

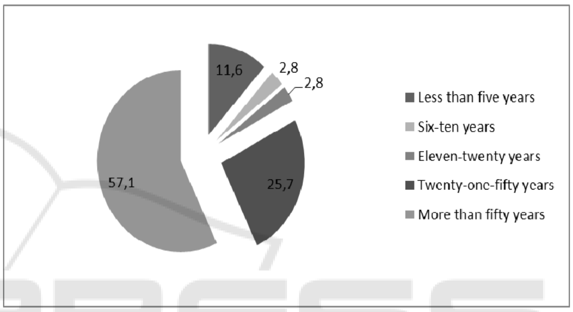


Figure 3: The age of the responded enterprises.

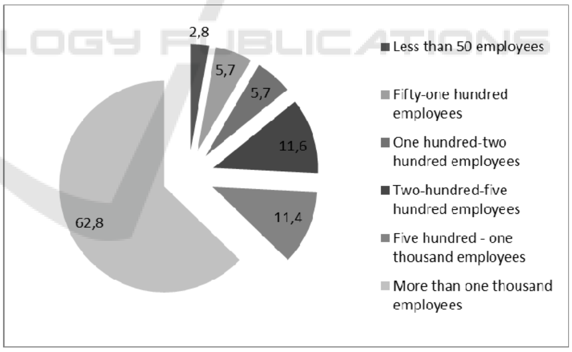


Figure 4: The number of employees (enterprise size).

Concerning the ownership of the informants the majority of the enterprises belong to public joint stock company (28,7 %), 20 % are joint stock company and 20 % are considered as federal state unitary enterprise (see fig. 6).

In coincidence with Russian Civil Code (Garant, 2017) these enterprises possess features of state budgetary supported enterprises from the one side and from the other they have possibility to raise capital through mechanism of stock exchanges.

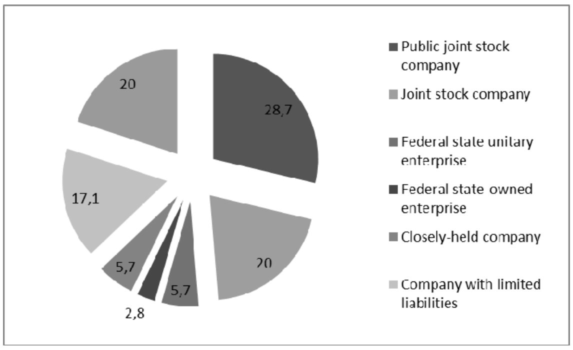


Figure 5: Ownership characteristics of informants.

## 5.2 Analysis Stage

The first part of the regression analysis dealt with the antecedents' impact on the KM capability, where KM capability was the dependent variable (V4) and innovation (V1), engineering processes (V2), organizational culture (V3) were independent ones.

Due to limitation of the paper size there are presented only final results of the regression model (Table 3). Firstly, the variable 1 has been included and tested its impact on the KM capability. Then, the variable 2 has been added. The predictors (independent variables) have been included in the analysis successively.

Table 3: Results of the regression analysis.

| Variable (Ind. and **Dep.**) | Parameters | | | | |
|---|---|---|---|---|---|
| | $R^2$ | F-value | β | t | DW coeff. |
| V1 (In.) | 0,5 | 21,2 | 0,42 | 2,59 | |
| V2 (Eng.Pr.) | 0,7 | 6,59 | 0,51 | 3,1 | 2,1 |
| V3 (Org.Cult.) | was excluded during the machine calculations | | | | |
| **V4 (KM Cap.)** | | | | | |
| The second part of the regression analysis | | | | | |
| V4 (KM Cap.) | 0,2 | 4,7 | 0,4 | 2,1 | 2,07 |
| **V5 (Com.adv.)** | | | | | |

According to the given results shown in Table 3 the variable 1 – innovation – has the impact to the KM capability. It is proved by the meaning of $R^2$ and F-value. $R^2 = 0,5$ and $F = 21,2$. The variable 2 – engineering process – has more impact to the KM capability. $R^2 = 0,7$ and $F = 6,59$. Therefore, we could postulate that innovation and engineering processes impact positively the KM capability.

As to organizational culture it has been excluded during the machine calculations. Therefore this antecedent hasn't been statistically significant. β coefficient, as a parameter providing statistical reliability, equals 5,1% for engineering processes and 4,2% for innovation respectively. It confirms the greater impact of engineering processes to the KM capability.

The lack of correlation (multicollinearity) between two predictors – innovation and engineering processes is proved by DW coefficient. The meaning of which is 2,1; it is proved that deviations are occasional and the regression model is statistically significant.

The second part of the model deals with the mediating effect of the KM capability on competitive advantages.

Thus as the value of $R^2$ is quite low (0,208), we can't say that the KM capability influences competitive advantages in high-technology engineering enterprises. DW coefficient equals 2,07, proving the lack of multicollinearity. β coefficient equals 4,5%. This meaning coincides with the β coefficient for innovation and explains the insignificant effect of the KM capability to competitive advantages.

## 5.3 Findings of the Research

The paper has searched the relationship between innovation, engineering processes, organizational culture and KM capability. The conducted research included the 35 questionnaires with high-technology enterprises. The given results are following: among three chosen antecedents the engineering processes has mostly impacted the KM capability ($R^2 = 0,7$). We could explain it that for high-technology enterprises engineering processes are key activities.

Organizational culture hasn't had a great impact in high-technology engineering enterprises as the new product development very often is a chaotic process. The survey has found out that innovation has had less impact to the KM capability as high-technology enterprises deal mostly with the modification of a new product. Innovation is not popular among the answers.

The KM capability is paid less attention in high technology engineering enterprises – that's why the mediating role of KM and competitive advantages hasn't been proved and hasn't coincided with the results of literature review. The more evident explanation is that in Russia knowledge management as an organization technology is relatively new.

## 5.4 Limitations of the Research

It is important to acknowledge this study's limitations.

First, due to relative novelty of KM as an organization technology, it was quite difficult to gather valuable data as informants sometimes needed to have explanations about this or that question. It is also worth to mention that the research sample is relatively small. Hence, the research initially contains occasional statistical errors.

Second, due to our focus on a parsimonious model, several potentially important factors may have been excluded in our research as is common in organization science models.

Third, although the regression analysis is widely accepted as a robust instrument of organizational factors' evaluation, perhaps a system of simultaneous equations would give other results. Thus, this issue should be tested in future research.

Nevertheless, the statistical quality of the investigated model is proved by DW coefficients and the lack of multicollinearity. Therefore we could postulate that the model has right to exist.

As for economic interpretation of the given results it is obvious the engineering processes are the key antecedent and should be properly supported. The lack of the KM capability mediating role can be explained by the relative novelty of this phenomenon and shortcomings of the questionnaire.

# 6 CONCLUSIONS

The present paper examines these relations taking into consideration knowledge-based view.

A common theme running through KM literature is that the KM capability is an important ability of an enterprises' competitiveness. Although much theorizing about this has taken place in subsequent literature there is a lack of empiric research how innovation, engineering processes and the KM capability affect competitive advantages. This paper tried to close this gap.

First, the empirical research provides initial support that this comprehensive theoretical platform incorporating both antecedents and the KM capability might provide a valuable alternative to prior separate focus on innovation, engineering processes and the KM capability.

Second, this study provides insight into the KM literature by including innovation, engineering processes in the research.

Third, the failure to find positive effect of the organizational culture on the KM capability may imply that for high-technology engineering enterprises it plays not significant role in comparison with innovation and engineering processes.

This study implicitly assumes that the investigated relationships are stable across various organizations, industrial and county contexts. Further research can build on this study by developing an extension that sees the relationship as depending upon specific context.

This paper also has several implications for business practice. Enterprises should enhance the KM capability for developing inimitable competitive advantages.

The insignificance of the organizational culture on the KM capability may cause the following explanation: the enterprises need information support and tangible benefits while increasing level of organizational culture.

The statistically non-proved mediating role of the KM capability may show that knowledge management as organization technology is not spread and well-accepted among high-technology engineering enterprises. Thus, the information support about KM is needed.

Finally, economic interpretation of the given results has revealed the necessity of supporting engineering processes; the expansion of knowledge management ideas and further research of the KM capability impact.

Thus, this study provides a few directions for future research. Firstly, impact of the KM capability on organizational performance (mainly financial results) may be explored. Secondly, moderating effects of external factors and the KM capability can be examined. Thirdly, other statistical measurement instruments such as simultaneous equations should be used in order to compare given results.

# REFERENCES


Pisano, G., 1997. The development factory: unlocking the potential of process innovation. *Boston M.A.: Harvard Business School Press.*

Crossan, M., Lane H, White R., 1999. An organizational learning framework: from intuition to institution, Academy of Management Review, 27(3).

Sabherwal, R., Sabherwal, S., 2005 Knowledge management using information technology: determinants of short-impact on firm value. *Decision Sciences, 36(4).*

Eisenhardt, K., Santos, F., 2002. Knowledge-based view: a new theory of strategy? In Handbook of Strategy and Management, A. Pettigrew, H. Thomas and R. Whittington, eds. London, UK: Sage.

Alavi, M., Leidner, D., 2001. Review – Knowledge management and knowledge management system. Conceptual foundations and research issues. *MIS Quarterly, 25 (1).*

Grant, R., 1996. Toward a knowledge-based theory of the firm. *Strategic Management Journal, vol. 17.*

Daneels, E., 2000. Organizational antecedents of second-order competences. *Strategic Management Journal*, 21 (11).

Frishamar, J., Kurkkio, M., Abrahamsson, L., Lichtenhaler, U., 2012. Antecedents and consequences of firm's process innovation capability. *IEEE Transactions on Engineering Management*, 59 (4).

Lager, T., Hoerte, S., 2002. Success factors for improvement and innovation of process technology in process industry. Integrated Manufacturing System, 13 (3).

Gold, A., Malhotra, A., Segars, A., 2001. Knowledge management: an organizational capabilities perspective. *Journal of Management Information Systems*, vol. 18.

Gudkov, A., The process of creation of a scientific intensive product. Mashinostroitel, vol. 1.

Gudkov, A., Chernyshov, A., Zelenov, et al., 2016. The development of a device for blood platelets safety storage. *Biomedical Radioelectornics*, vol. 3.

Gavrilova, T., Gorovoy, V., Bolotnikova, E., 2010. Evaluation of the cognitive ergonomics of ontologies on the basis of graph analysis. *Scientific and Technical Information Processing, 37 (6)*.

Maglyas, A., Nikula, U., Smolander, K., 2012. Document Lean solutions to software product management problems, *Source of the Document IEEE Software*, 29 (5).

Popov, V., Ustinov, V., Tchaliy, V., et al., 2016. Results of Russian-Belarusian scientific cooperation in creation of new nanoheterostuctures. *Nanotechnologies: development, application – XXI century*.

Drayper, N., Smith, G., 2003. Applied statistic analysis. Statistics, Moscow.

Pearce C., Ensley M., 2004. A reciprocal and longitudinal investigation of the innovation process: the central role of shared vision in product and process innovation teams. *Journal of Organizational Behavior, 25 (2)*.

Pfeffer, J., Sutton, R., 1999. Knowing what to do is not enough. *California Management Review, 41(1)*.

Hsu, I, Sabherwal, R., 2011. From intellectual capital to firm performance: the mediating role of KM capabilities *IEEE Transactions on Engineering Management,* 58 (4).

Freeze, R., Kulkarki, U., 2005. Knowledge management capability assessment: validating a knowledge assets measurement instrument // *Proceedings of 38th Hawaii International Conference on System Sciences.*

Dawson, R., 2000. Knowledge capabilities as the focus of organizational development and strategy. J. of *Knowledge Management, 4 (320)*.

Song, Y., Le, Y., Wang, Y., 2016. Impact mechanism of organizational culture on organizational effectiveness from competing values framework perspective in Chinese context // *Proceedings of the IEEE International Conference on Information and Automation.*

Podsakoff, P., Ahearne, M., MacKenzie, S., 1997. Organizational citizenship behavior and the quantity and quality of work group performance. *J. of Applied Psychology, 82 (2)*.

Malhotra, N., Kim, S., Patil A., 2006. Common method variance in is Research: A comparison of alternative approaches and a reanalysis of past research. *Management Science, 52 (12)*.

Zheng, W., Yang, B., McLean G., 2010. Linking organizational culture, structure, strategy and organizational effectiveness: mediating role of knowledge management. *Journal of business research, 63 (7)*.

Tokarev, E., 2013. Market research. *Infra-M, Moscow.*

Golubkov, E., 2008. Market research. *4th ed., Finpress, Moscow.*

SPSS Statistics, 2017, available at http://ibm-spss-statistics-base.ru.uptodown.com (accessed May 01, 2017)

Russian Civil Code, 2017, available at http://base.garant.ru/10164072/ (accessed May 10, 2017).