Methods of Condition Marketing Research and Needs Changes in Information Resources in Economic Sectors

K.V. Novikova, E.A. Kerzina and V.V. Petrov

Department of Marketing in PSNRU, Perm State National Research University (PSNRU), Russia

Abstract: The study marks the challenges and opportunities of studying both current and projected needs for information resources, there is a common problem of inefficient use of information resources at the enterprises but research tool for their quantitative needs is well developed. Global and national trends of information resources market have been considered, the classification of information resources by industries has been given. On the basis of the characteristics and current trends in the use of information resources hypotheses have been put forward: Russian companies focused on the domestic market, use mostly Russian information resources; most Russian companies are characterized by high information protection; Russia is in transition to informational economy which leads to the need for industries to new storage technologies and exchange of information; demand for national research publications is formed only in a narrow segment of businesses. Also methods of analysis and forecasting of information needs have been considered, the main disadvantages, advantages, opportunities and threats of each method of research have been identified: bibliometric analysis, sciencemetrics, webmetrics, patent research, foresight, scenario analysis, marketing research. It was found that during the study of the needs of industries and organizations, it is important to consider the type of information, language, scope of activities pertaining to the information resource, the level of socio-economic development of the country as a whole, the level of knowledge economy. On the basis of the analysis guidelines for conducting market research of information needs have been suggested. They take into account both retrospective information on information resources and behavioral component. In this study for the first time criteria characterizing the motives of management decision-making on the use of information resources in domestic enterprises have been introduced.

Key words: Information needs, information resources, Information Technologies (IT) research tools, enterprises, branches of industry, research methods, economic-mathematical methods, expert methods, the international and national market of information resources

INTRODUCTION

Modern society has entered a new stage of development where the volume of information resources reached enormous proportions and gave impetus to the development of the information economy. Development of the system of reproduction of information resources led to the fact that in today's world, the cost of goods and services depends on the accumulation and use of knowledge and the share of the cost of physical labor, materials and energy has been steadily declining. Information has become one of the most important strategic resources which affects the development of countries, industries and organizations. However, the increasing amount of information has led to the need to increase the volume of storage costs and the level of information support.

The problem of inefficient use of information resources due to the lack of demand for advanced development in the field of Information Technology (IT) from the real economy, the lack of transparency in the IT sector, a small amount of information providers that would meet the needs of the business, the lack of professional staff in this area is widespread. However, the tool for quantitative research needs in the information resources is designed quite well. This is reflected in a wide range of statistical, mathematical and expert methods of information processing, modern methods of sociological surveys.

The modern market of information resources has a developed structure and there is a clear trend of increasing information needs both from the side of industry sectors and individual companies. IT markets of different countries have large structural differences (Smirnov, 2014).

Corresponding Author: K.V. Novikova, Department of Marketing in PSNRU, Perm State National Research University (PSNRU), Russia

A clear indicator of increasing trend towards the use of information resources in Russia is the proportion of organizations that used the Internet for 10 years the number of organizations that use it has doubled. Technological innovation the result of intellectual work in which the available information is an important factor. Costs on technological innovations of organizations in the Russian Federation for the years 2009-2013 only increased in >3 times. Figure 1 has exponential growth. All this shows the growing importance of information resources.

The analysis of methodologies and approaches to the study of the needs in the information resources: There are many different methods and approaches to the study of the need for information resources. To date, there were some of the most common approaches to the study of the needs of information resources:

- The study of the parameters of activities which include the required information resources
- Analysis of demand and market structure based on surveys of target groups-consumers of information
- Market research based on analysis of secondary information of the requirements for information resources

The first two approaches make it possible to form an objective picture of the information needs of industries and enterprises. In practice, the approaches are often used, however, the need to collect large amounts of data, the subjectivity of its source as well as higher labor and classified information on the companies makes these approaches not always rational and impose condition of representativeness of the original sample. The third approach allows to evaluate information needs using indirect aggregated values that characterize both the market of information resources in general and environmental conditions that affect the market in particular.

The study addressed the following methods of forecasting demand for information resources: bibliometric analysis, sciencemetrics, webmetrics, patent research, foresight, scenario analysis, marketing research (interviews, questionnaires, talks) of users. Within the study, SWOT-analysis of each approach was conducted (Table 1).

On the basis of reviewed research methods as well as existing features and market trends of information resources, we can say that each of the methods has its own advantages and disadvantages but none of them gives accurate data about their content and also limits the possibility of formation of predictive models, hence the need for a comprehensive analysis appears.
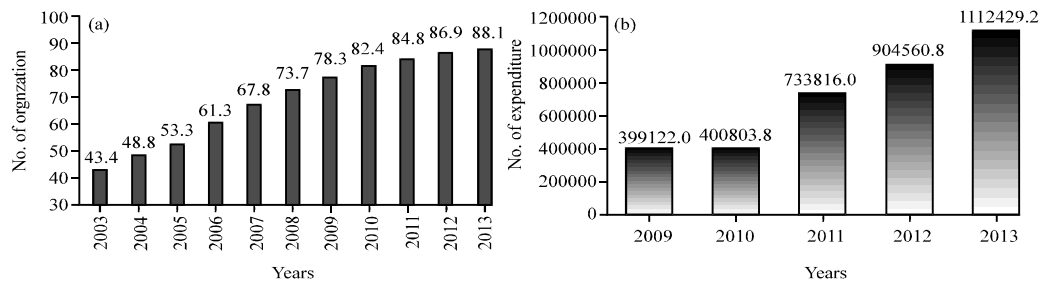

Fig. 1: Comparison of the changes in the proportion of organizations that use the internet (as a percentage of the total number of surveyed organizations) and the dynamics of the cost of technological innovations in organizations (mln. Rub.), RF

Table 1: Techniques for forecasting needs in information resources (SWOT-analysis)

Methodologies	Advantages	Disadvantages	Possibilities	Threats
Bibliometric analysis	Access via the Internet to a database of publications on modern scientific developments and prospective studies (Marshakova-Shaikevich, 1995)	High complexity of data collection. There is no database that would contain all national and international publications	Identification of incentives for new IT creation. Possibility of justified long-term forecasting. Opportunity of analysis in division	Researches may not reflect the priorities of the development of information industries. Accounting for publications that are not related to the topic of study
Sciencemetrics	Availability of ready quantitative baseline data for the study. Database with data on sciencemetrics	Most of the resources do not take into consideration the language component. A large amount of unstructured information files, including in a time section	It can be used in the analysis of the needs for all kinds of information resources	The high cost of access to some electronic items and large amounts of unstructured information may not be appropriate

Table 1: Continue

| Methodologies	Advantages	Disadvantages	Possibilities	Threats
Webmetrics	Research tool based on key phrases and word combinations. Clarity. Accounting of conjugated information, national and international markets, requests in section: time, space, industry	The problem of formalization and generalization of data arrays. Investigation of a particular type of information. The complexity of selecting key phrases for analysis. High price. It is not possible to identify behavioral factors	It may be used when analyzing the demand for mass consumer information. Perhaps the need for high-cycle information	It may not take into account the perspectives of the studied parameters. Incorrect selection of keywords. Large amount of information can be invisible to the modern search engines. There may be a "driven up" site traffic and requests
Patent researches	Evaluation of information about all kinds of objects of industrial property in the long perspective. Complete information on scientific and technological achievements of the leading countries of the world.	High complexity of data collection. It takes a great amount of time for the a nalysis of patent information Expensive access to patent databases	Identification of the most effective scientific and technical achievements and indicators of competitiveness of information resources and long-term trends in research-intensive sectors of the economy	Important information about scientific and technological developments can be classified. A deep analysis of the market conditions can take into consideration the developments not related to the research topic
Foresight	Maximum formalization of the problem; availability of modern tools for analysis. Search for the most important statistical indicators for the construction of models	High complexity of data collection. Large amounts of information. "Short" time series with gaps. The technique is not universal for all kinds of research	It can be used to search for promising areas of science and technology. Ability to search the hidden factors affecting the information needs of enterprises	The results obtained by different methods of foresight may not match. Wrong choice of a set of methods of analysis may be ineffective
Scenario analysis	Actual representation of forecast information at a predetermined interval of time. The availability of modern mathematical methods and software for data analysis. Correction of scenario factors in operative mode	High dependence on the quality and reliability of the source data. High subjective assessment of future trends in baseline factors. "Short" time series with gaps. Low efficiency in the long term forecasting. It requires high competence of experts	A detailed description of the sequence of projected events receipt. Ability to conduct a sensitivity analysis to the baseline factors, inverse analysis, quantitative evaluation of each factor affecting the needs, comparisons of possible or desired directions of development (Novikova and Volgina, 2014)	The threat of not taking into account significant factors in the models that will lead to the wrong conclusions on projected needs for information resources. Factors that are important in the formation of the information needs of organizations can be insignificant in models. The lack of historical data for analysis (Novikova and Volgina, 2014)
Marketing research	Takes into consideration behavioral (psychological) component of the actual resource users. Allows you to identify the root causes of managerial decision making (Malhotra, 2002)	A lot of data (either retrospectively or panelly) is required. The complex formation of representative samples. Limiting the analysis to the domestic market	Forecasting information needs on the basis of expectations of enterprises	The results obtained may no longer be relevant. The threat of not to take into account the important information from the experts because they may not always feel their information needs
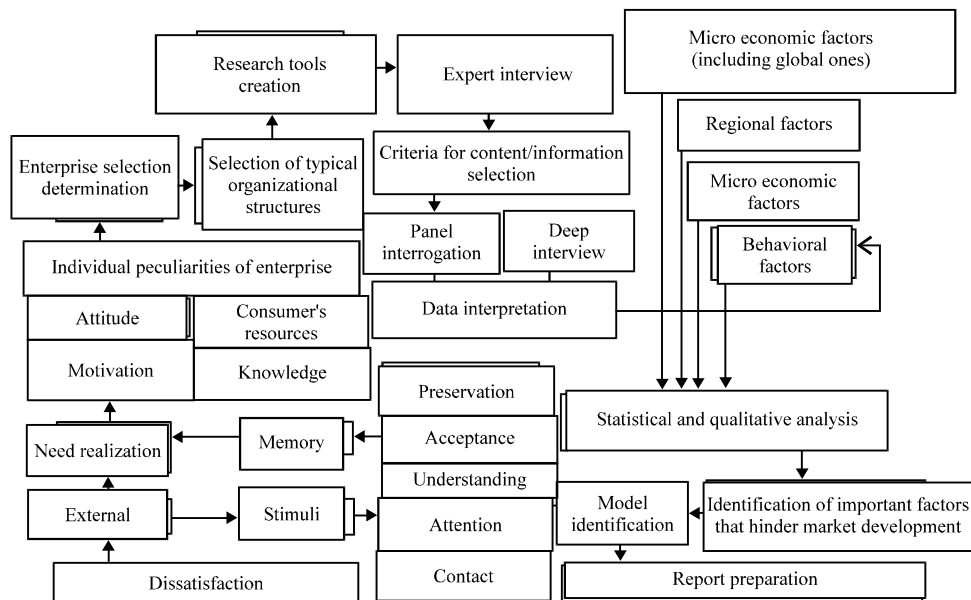
Fig. 2: Methods of marketing research with the stages of formation of the need for information resources

MATERIALS AND METHODS

Author market research methodology: In view of the facts, set out above the technique of marketing research based on customized qualitative and quantitative research has been suggested. Its application allows to identify specific criteria, causing information needs as well as internal organizational factors that influence the collective (group) consumer demand and to build an adequate predictive model of information resources needs in sectors of the economy for the long term (Fig. 2).

Identifying data that can be markers and qualitative characteristics to build a model of prediction of the need for information resources. It requires an assessment of current needs (i.e., the state of the needs) economy and its subjects and the factors influencing their formation (Novikova, 2013). Therefore, during the preparatory phase it is recommended to use content analysis of secondary information.

RESULTS AND DISCUSSION

Analysis of factors of information resources market: One of the key factors that characterize market information resources is language. Its analysis makes it possible to determine the level of language barriers faced by economic subjects. It is necessary to take into account the fact of "fuzziness" between domestic and world market of information resources. According to the copyright content analysis, the largest amount of information resources in the world market are in English about 40% and only 2% in Russian. Thus, we can formulate the following hypothesis "Russian companies focused on the domestic market, use mostly Russian information resources (according to the rule of Pareto structure of use is 80-20%)".

Another important factor is the industry's activities. By branches of activity the world market of information resources is divided into four sectors:

- Sector of business information
- Sector of scientific and technical information
- Sector of specialized information
- Sector of mass consumer information

According to the information resources market research, the US is the leader in terms of generating business information in 2014 (46%). In assessing the companies information transparency index in 2013, it was revealed that the majority of countries have an average and high level of transparency of information companies and organizations. However in Russia this figure is still low. Therefore, the following hypothesis can be formulated as follows: "The majority of Russian companies are characterized by high data protection. When monitoring the needs of Russian enterprises in the information resources the researchers will face the problem of access to the enterprise that will require the involvement of the administrative resource".

Sector of scientific and technical information in the global market of information resources should be analyzed in the context of the knowledge economy index. This international index measures to what extent innovation and knowledge are in general demand in the economy of a country. According to data for 2013, the maximum value of the index of the knowledge economy is typical for North America (8.80), the lowest index for Africa (2.55). This suggests that the index of the knowledge economy in most countries is above average. This indicator allows us to formulate a third hypothesis: "Russia is in transition to a knowledge economy which leads to the need of industries for new storage technologies and exchange of information".

As an indication of the sector of specific information we analyzed citation index of scientific publications and the level of R&D costs. As a result of grouping on the basis of indicator of demand for scientific publications for the year 2012, the leader of the country's relative weight in the global number of citations in scientific journals is the United States (over 20%). China, Britain and Germany are in the second group (10-20%). For Russia, this figure remains at 1.5%. Therefore, the fourth hypothesis assumes that demand for national research publications formed only in a narrow segment of the business.

To determine the degree of influence of external social and economic factors on information requirements it is appropriate to use statistical methods (Ayvazian and Brodsky, 2006). In this case, it will be able to track the dynamics of indicators and define various statistical characteristics of factors and output data. In the context of the specificity of the information resources, we should take into account multi-scenario of market development.

The above factors and hypotheses must be taken into account when determining samples and developing tools of marketing research. Development of tools should be carried out with great care with involvement of experts in the field of quantitative and qualitative research, practitioners of IT business. Testing of tools is available only after a five-step inspection and testing on a sample of at least 5 subjects of market in the case of qualitative methods and 100 in the case of quantitative methods.

The study of the needs with the help of the competent experts will give an opportunity to understand the models of collective behavior, points of view, stereotypes of subjects of the market of information resources and therefore to draw conclusions about the changes in needs in the short and long perspective. Therefore, the researchers technique provides for the mandatory use of qualitative research methods such as in-depth interviews and/or focus groups. The decision to use specific research methods to be applied depending on the amount of accumulated data, the rate of changes over the time of current needs and also challenges facing the analyst.

CONCLUSION

Thus, the market information resources of the Russian Federation has a developed and complex structure, so it is important during analysis to take into account type of information, language, scope of activity of the information resource, the level of socio-economic development of the country as a whole, the level of the knowledge economy, it allows you to organize information and reduce the complexity of the study. In developing the methodology of marketing research of status and changes in needs of information resources in sectors of economy existing practices and characteristics of national and global IT market, specific industries, regions and enterprises were taken into account. For the first time the criteria characterizing the motives (behavioral factors) making managerial decisions on the use of information resources in domestic enterprises have been introduced. The results of market research allow to balance quantitative retrospective data with quality weights.

REFERENCES

Ayvazian, S.A. and B.E. Brodsky, 2006. Macroeconomic modeling: approaches, problems, an example of the econometric model of Russian economy. J. App. Econo., 1: 2.

Malhotra, K.N., 2002. Marketing Research. A Practical Guide. 3rd Edn. Hardcover. Translation from English. Publishing House "Williams" pp: 960.

Marshakova-Shaikevich, I.V., 1995. The role of bibliometrics in the evaluation of research activity of science. http://www.mathnet.ru/links/98b5bab6c 553677fa863f66689b0861a/ubs696.pdf.

Novikova, K.V., 2013. New Information Space as a Factor of Development of Modern Society. Middle-East J. Scientific Res., 17 (1): 127-129. http://www.idosi.org/mejsr/mejsr17(1)13/22.pdf.

Novikova, K.V. and V.V Volgina, 2014. Forecasting analytics tools market: modern aspect. Scientific and practical Journal "Modern Economy: Problems and Solutions", 3 (51): 29-34.

Smirnov, A., 2014. Characteristics and trends in the global information technology market development in 2008-2013. http://www.moluch.ru/archive/67/11402.