

Big Data Application in Information Support of Organization Management: Problems and Prospects



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Abstract The article discusses the prospects and problems of using Big Data by Russian companies. In the conditions of the initial development of the Big Data market in the Russian Federation, it is important to adapt business management technologies to the use of large amounts of information. In order to monitor the current situation, 15 financial specialists involved in the work of small, medium and large businesses using Big Data processing and analysis technologies were interviewed. Meanwhile, the interviewees admit that under the influence of information innovations, there are wide opportunities for using Big Data to solve predictive analytics problems, build flexible management reports, form an informed opinion about the need to create reserves and other estimates, obtain information about events after the reporting date, and collect and link integrated reporting data. It is concluded that the systematic use of Big Data becomes the basis for companies to make the transition to a qualitatively new level of management of all business processes and poses new challenges for specialists to constantly apply interdisciplinary approaches when solving specialized professional tasks.

Keywords Big data · Business analytics · Corporate reporting · Information innovations · Organization management

1 Introduction

Today, in Russia, as well as in the whole world, there is a process of digitalization of the economy, against which Big Data is becoming an important part of the information support of business management. The reason for this trend is the high quality level of business information support provided by large volumes of various data at their high processing speed. The use of Big Data in management decision-making provides unprecedented competitive advantages due to the ability to compare external information about consumers, marketing and logistics information, data on internal

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business processes and other facts that at first sight are not related to each other. Processing large amounts of information provides a synergistic effect, allowing to identify important factors to improve the organization efficiency.

The Russian Big Data market is still at the initial stage of development. At the same time, the tasks of working with large amounts of information, which are increasing, are constantly becoming more complex. The need for up-to-date technologies for their processing, methodological approaches to further application and solving related organizational problems is growing. These trends were the reason for the development of the national standard of the Russian Federation, detailing the structure and process of applying the reference architecture of Big Data [1]. To develop this standard, researchers from the National Center for Digital Economy of Lomonosov Moscow State University and Institute of the Information Society were involved. However, if we compare the spheres of economic activity, we can note the uneven development of the process of using Big Data in management decision—making. Thus, the most active collection, systematization and analysis of Big Data in Russia is carried out in the following areas of activity (information obtained from public sources):

- in the banking sector (Sberbank, Gazprombank, VTB24, Alfa-Bank, FC Otkritie, Raiffeisenbank, Citibank, Uralsib Bank, OTP Bank, Troika Dialog, All-Russian Bank for Regional Development and Ural Bank for Reconstruction and Development»);
- in retail (X5 Retail Group, Gloria Jeans, Ulmart, Lenta hypermarkets, M. Video, Wikimart, Ozon, Azbuka vkusa»);
- in the field of telecommunications (MTS, VimpelCom, Megafon);
- in the oil and gas sector (Transneft, Rosneft and Surgutneftegaz).

Enterprises engaged in other types of economic operations actively want to adopt the successful experience of international companies and Russian enterprises that have already managed to implement the Big Data system in their business processes.

Increasing amounts of information require not only technological adaptation, but also the development of approaches to the use of Big Data in the process of enterprise activity and business management. The active development of Big Data consulting largely indicates the lack of customer companies' understanding of the capabilities of this information resource and the skills of its use in the implementation of business processes. In this regard, the issues of studying the existing experience of financial specialists for understanding and evaluating the prospects for using Big Data in solving specialized professional tasks are particularly relevant.

2 Methodology

In order to form an opinion on the readiness of the use of Big Data in solving the problems of information support for business management, 15 financial specialists involved in the work of medium and large businesses operating in St. Petersburg and

Table 1 Questions asked to financial professionals during the interview

1	Does your company use Big Data in the information support process of business management? How long is this process and is it systematic?
2	What challenges did you face when implementing the use of Big Data to solve business management issues?
3	What software products for collecting and organizing Big Data do you use in your professional activity?
4	How often can you identify the result of using Big Data when making professional decisions?
5	What is the unique competitive advantage of using Big Data to solve your professional tasks?
6	In what areas of your professional activity do you see the greatest prospects for the use of Big Data?
7	What threats to the use of Big Data for business management do you see?

Source Author

Samara were interviewed. These companies are profiled in various areas of economic activity—construction, consulting, retail, wholesale trade, telecommunications, housing and public utilities.

During the interview, specialists were asked questions from the list developed by the author, presented in Table 1. The assessment of the readiness of financial specialists to use Big Data for solving business problems cannot be reduced to a narrow range of formal survey questions. That’s why the interview also implied a possible discussion of the issues that were not previously stated in the list, but now they require discussion due to their relevance.

As a result of summarizing the received responses, a systematic analysis was carried out. It allowed to form an opinion about the use of Big Data by individual financial specialists for the purpose of information support of business management.

3 Results

The information obtained as a result of the interview is summarized in the sequence corresponding to the questions previously systematized in Table 1.

1. During the interview process, it was found that companies work with Big Data taking into account the existing experience and allocated resources, while this work cannot be called systematic. The interviewees note that companies mostly start analytical activities for processing large amounts of information not because of a forward-looking economic justification of the performed calculations feasibility, but largely due to the impact of threats of competitive advantages loss due to ignoring significant trends of the external environment, about which the company did not have the required information at the right time.

2. One of the key problems with the use of Big Data nowadays is the lack of analysts' experience in extensive work with it. The interviewees admit that they have serious concerns when new tasks arise for analyzing significant amounts of information, in which they do not have practical experience. At the same time, they are convinced that the information resource of Big Data is not yet fully used, that is, the lack of "package" solutions of their use seriously complicates the use itself. This circumstance is largely due to the fact that some companies acquire not the technology of working with Big Data, but some ready-made products with built-in implementation methods for solving a dedicated range of applied issues, so the expanding the scope of application in such situations is out of question.
3. SAP, Oracle and the Power BI tool (from the Microsoft Office 365 package) were named among the programs identified by the interviewees for working with Big Data.
4. All interviewees signaled that the systematization of the results of Big Data analysis is carried out as information needs arise.
5. Processing of large amounts of information is carried out using cloud technologies (they are low-cost network structures that provide access to information at any time and in any place) and using distributed analytics mechanisms, which allows you to store almost infinite amounts of data electronically and perform various actions with such data. In the analysis of the company's business processes, the use of Big Data allows to get a synergistic effect and reach a qualitatively new level of management decisions.
6. In the field of corporate financial reporting, Big Data can be used to obtain information about corrective and non-corrective events after the reporting date, to form conclusions about the best value of the estimated values. There are many opportunities to use Big Data to form an opinion about the need to create reserves and their reasonable value. Itself, corporate reporting in the conditions of digitalization of the economy stops to be a separate element of information, being in constant symbiotic interaction with non-financial information, taking into account the use of Big Data. From the point of view of any non-financial corporate reporting, the Big Data resource is extremely important, since this reporting format summarizes key information about the impact of the business entity's activities on the social sphere, environment and other significant areas. In integrated reporting, it is important not only to correctly use and evaluate the available non-financial information, but also to ensure that the individual content blocks included in it are interconnected to ensure the quality of the information content.

In the field of operational and management accounting, the benefits from implementing Big Data analysis can be obtained everywhere due to the ability to quickly and clearly detail indicators, create flexible management reports that are available at any time and in any place, which significantly improves the quality of made decisions. In the field of business analytics, the greatest economic impact is expected from the use of Big Data, but to obtain it, it is important to understand the possibilities of systematic use of this resource. Big Data has

already led to major changes in marketing analysis, but we can also expect the development of tools for investment analysis, business planning analytics, and systematic performance evaluation. Large data sets are used to solve predictive analytics problems, create simulation and econometric models that are reliable for making management decisions.

7. Paradoxically, the interviewees see the cloud technologies used as a significant source of threat to the use of Big Data, which are also an advantage of accessing the information simultaneously. At the same time, cloud servers are often owned by non-residents and the ability to control their use by the customer is very limited. In this regard, the respondents expressed concern about the possibility of interception of information by competing companies, which can critically affect the business conducting. It is a fact that in the conditions of digitalization of the economy, computer crime is progressing (cyber attacks, the use of spy software and malicious software), and, therefore, this circumstance requires increasing the level of information protection and testing it for reliability before use.

In addition, many small and medium-sized enterprises that are not ready to work for the future and use only a narrow set of package cases may, without getting the expected high result, abandon the use of Big Data in principle, although in fact they have evaluated only a small part of the possibilities.

4 Discussion

Al-Htaybat and von Alberti-Alhtaybat identified the paradoxes of the impact of Big Data on corporate reporting, in particular, the expansion of opportunities and the accompanying enslavement, the satisfaction of some and the generation of other needs, the reliability of data and its unbalanced timeliness, the simplicity of the result and the complexity of its receipt [2].

Coyne, Coyne, and Walker are convinced that in order to process and systematize large amounts of various data in order to manage an organization, it is advisable to take into account the specifics of the life cycle of Big Data, since the process of its generating is actually the transformation of Big Data into information suitable for solving specific tasks [3]. In addition, analysts should not forget about the inherent risks of this process.

Kaya and Akbulut note the significant changes in the technologies of accounting information systematization and its subsequent analysis that have occurred under the influence of the digitalization of the economy, drawing attention to the fact that this poses new interdisciplinary challenges for accountants and analysts [4].

Kar and Grover note the predominant use of Big Data to achieve the company's business goals in marketing and building the supply chain [5]. At the same time, the analysis of consumer behavior involves, first of all, the systematization of social network data and the intellectual analysis of text information. The researchers are

convinced that the expansion of the sphere of Big Data application in business can be achieved through the development of technical and methodological tools for their analysis by specialists, which will allow to reach a new level of solving the problems of information support for managing the company's activities.

Llave also notes the significant impact of the technical aspects of Big Data analysis on the quality of generated business-analytics [6]. Thus, the researcher found that the use of data lakes can significantly improve the efficiency of analytical procedures. At the same time, data lakes can perform several significant functions. Firstly, being intermediate data stores, secondly, a kind of bases for experimental analytical actions, and, thirdly, acting as a direct source of business intelligence data.

Liu, Peng, Yu, during the studying the features of the use of Big Data in insurance companies, found that the analysis of spatio-temporal information in the development of insurance packages and building relationships with customers can achieve significant results in improving the efficiency of activities [7].

Sun, Sun, and Strang in the course of their research proved that the most important component in the use of Big Data is the technical part of the problem [8]. They defend the need to develop a service-oriented architecture for subsequent use for Big Data analysis, which, in their opinion, should improve the quality of corporate information systems.

Shahzad, Xiu, Shahbaz analyzed the features of the development and further use of software for Big Data analysis by companies [9]. Using economic and mathematical methods of processing the results of a survey of 215 companies in Pakistan, they established a significant impact of the organizational culture of a business entity on the quality of information obtained in the process of using Big Data. The researchers are convinced that it is the high level of organizational culture of the enterprise that contributes to the creation of the necessary conditions for creativity and innovation of both programmers and analysts involved in working with Big Data.

Sproviero, in the course of a study conducted in relation to business entities of the Italian banking sector, revealed the high value of Big Data for the formation of integrated corporate reporting [10]. This is due to the influence of many external circumstances and existing relationships with counterparties on the company's activities, which affects the results of the corporation's functioning. Sproviero names the human resource potential, which consists in the professional experience of analysts and their innovative approach, as a key factor in the effective use of Big Data, saying that the use of corporate regulations for structuring the stages of Big Data application does not bring good results without the necessary specialists. Sproviero is convinced in the need for all financial professionals to apply an interdisciplinary approach, where performers integrate the tasks of collecting information, its qualitative systematization and long-term analysis.

Tiwari, Wee, and Daryanto note the essential importance of Big Data in shaping the company's supply chain [11]. At the same time, the use of information arrays in supply management can be built not only individually for each specific company or industry, but even offer universal approaches to Big Data analysis to solve end-to-end supply coordination problems.

5 Conclusion

The active development of information technologies leads to the fact that companies have to process, systematize and analyze more and more large amounts of data in order to ensure their competitiveness. At the same time, Russian business entities and specialists are still only accumulating experience with Big Data and adapted well to solving well targeted tasks using large amounts of information, such as marketing analysis or supply chains. Meanwhile, the potential of using Big Data in building and controlling business processes is more significant.

According to the results of the study, it is concluded that technologies for collecting, systematizing, analyzing and interpreting Big Data in the digital economy are becoming a significant corporate asset used for information support of company management. The economic benefits of this asset are obtained by providing forecasting, trading analytics, instant access to critical information and forming a flexible representation of it, taking into account the needs of the user.

The rapid transformation of information and technological innovations requires business entities to develop an innovative operating environment, and challenges financial professionals to constantly apply interdisciplinary approaches. In addition, there are new threats associated with the development of digital crime in the course of this process. It is obvious that a high-quality solutions to these complex systemic problems can be achieved only through the joint efforts of the state, business and educational institutions.

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