

Factors Influencing the Implementation and Use of Big Data Analytics in the Process of Financial Management of the Industrial Enterprises in Bulgaria

Nelly Arabadzhieva

Abstract - Big data is one of the latest business and technical issues in the technology era. Hundreds of millions of events occur every day. The financial world is deeply involved in the computation of big data events. As a result, hundreds of millions of financial transactions take place every day in the industrial world. Therefore, financial professionals and analysts believe that this is an emerging problem in data management and analysis of various financial products and services in industrial enterprises in Bulgaria. Therefore, identifying the factors where big data has a significant impact is also an important issue to explore with the influences.

Big data analytics is the process of extracting relevant information and insights from large data sets to inform and support decision-making. In industrial enterprises, Big Data Analytics can be used to analyze financial market trends, customer behavior, fraud detection, risk management, etc. Big Data is one of the latest technological advances with strong applicability in almost every industry, including manufacturing. However, despite the business opportunities offered by this technology, its adoption is still at an early stage in many industries. Thus, this study aims to identify and rank the significant factors influencing big data adoption and in turn predict the impact of big data adoption on the performance of manufacturing companies.

Keywords: finance management, big data analytics (BDA), industrial, IT.

1. INTRODUCTION

Literally, BDA is the process of evaluating data that is large in order to find hidden patterns, unknown correlations, and other useful information.

The use of Big Data (BD) should also help to plan and utilize currently unused data sets.

Undoubtedly, the Bulgarian industry cannot lag behind the evolution of industry on a global scale as regards its development. Regardless of its own development path, the Bulgarian industry is "looking" into the future by adopting cloud technologies and network intelligence in its operations.

In recent years, since 2000, the development of Internet technologies has been a particular focus in the industrial development. Following the global development from Internet 1.0 to Internet 4.0, Bulgarian industrial companies are increasingly relying on the use of cloud technologies and big data in their activities. According to experts, more than 40% of the industrial enterprises use social networks, the Internet of Things (IoT) and other Internet technologies in

their business.

The object of the assignment includes the industrial enterprises in Bulgaria. Industry 4.0 ensures merging of the real world with the virtual world. This digital revolution is marked by a technology that takes advantage of the benefits of big data and artificial intelligence (AI) to power automatic learning systems and is widely used in industrial enterprises.

The subject of this paper is a study of the factors influencing the implementation of BDA in the corporate financial management process.

The purpose of the report is to study and analyze the factors that influence the implementation and use of Big Data Analytics in the industrial enterprises in Bulgaria.

The methods are based on a review of the literature and studies already carried-out in the field.

According to a study called "Linking big data analytics and operational sustainability practices for sustainable business management by (Raut et al., 2019)", the study results show that the management style and leadership, as well as the state and central government policies are the two most important factors for big data analytics and sustainability practices. The results provide unique insights for the manufacturing companies to improve their sustainable business performance from the perspective of operations management. The study provides theoretical and practical insights into issues related to implementing big data in achieving sustainability practices in business organizations of emerging economies.

The results obtained from a study called "Barriers to big data analytics in manufacturing supply chains: A case study from Bangladesh by (Moktadir et al., 2019)" are as follows: (i) data-related constraints are most important, (ii) technology-related barriers come second, and (iii) the five most important components of these barriers are: (a) lack of infrastructure, (b) complexity of data integration, (c) data privacy, (d) lack of availability of BDA tools, and (e) high cost of investment. The findings can help industrial managers understand the true nature of the barriers and the potential benefits of using BDA, and make a policy on the adoption of BDA in the manufacturing supply chains.

An analytical review of the literature concludes that the relative advantage, complexity, security, senior management support, organizational readiness, and government support influence the adoption of BD, while competitive pressure and compatibility appear to have negligible influence. The conclusions are based on several articles, surveys and studies,

some of which include - Linking big data analytics and operational sustainability practices for sustainable business management by (Raut et al., 2019); Roles and Capabilities of Enterprise Architecture in Big Data Analytics Technology Adoption and Implementation by (Gong & Janssen, 2021).

One of the most significant challenges in implementing Big Data is related to expensive infrastructures. Sivarajah et al. (2017) state that people need to analyze in order to sort data for the purpose of constructing valuable information. A computer technology is necessary to improve storage space and human experience. According to Akerkar (2014), the main drawbacks of Big-data are data-related challenges, process-related challenges and management-related challenges. Arunachalam et al (2017) state that organizational challenges are time consuming, related to insufficient resources, privacy and security concerns, behavioral issues, and return-on-investment issues. IAL provides a unique set of opportunities for businesses. Challenges regarding big data include data integration, data privacy issues, insufficient resources and infrastructure (Kim et al., 2014). To address big data challenges, an advanced BDA analytic requires highly efficient, flexible, and scalable skills (Sivarajah et al., 2017).

2. DESCRIPTION

There are several existing studies on the adoption of BDA in industrial enterprises. For example, Ajimoko analyzes the main criteria for the adoption of cloud big data analytics based on three models, which are: the theory for innovation

spreading, the technology adoption model, and the technology-organization-environment framework. The results of the study classify the significant implementation criteria into two categories, internal and external. Internal criteria include technological and organizational factors that play a crucial role in adoption; external criteria consist of vendor- and environment-related factors having a smaller effect on the adoption of BDA.

Systematization of the factors influencing the adoption of BDA is made based on the analyzed literature.

Factor No. 1: Professional practice/qualification

In practice, only qualified personnel are able to use processing of financial data of industrial enterprises.

At the same time, enterprises are turning to BD outsourcing, but the risk of confidential data loss and information leakage to their competitors can have an adverse impact on their adoption, and therefore BD service providers need to build confidence and trust in the services offered. Building trust is usually a result of the service provider's reputation or previous customer experience.

Factor No. 2: Technological aspect

The second factor, called technological, relates mostly to the data quality and reliability. IT professionals play a major role in implementing BDA programs. Studies in the literature point out that the technological context sheds light on the exogenous and endogenous elements of the technology in terms of its adoption, with one of the elements having a relative advantage. Clearly stated, the perceived advantage of

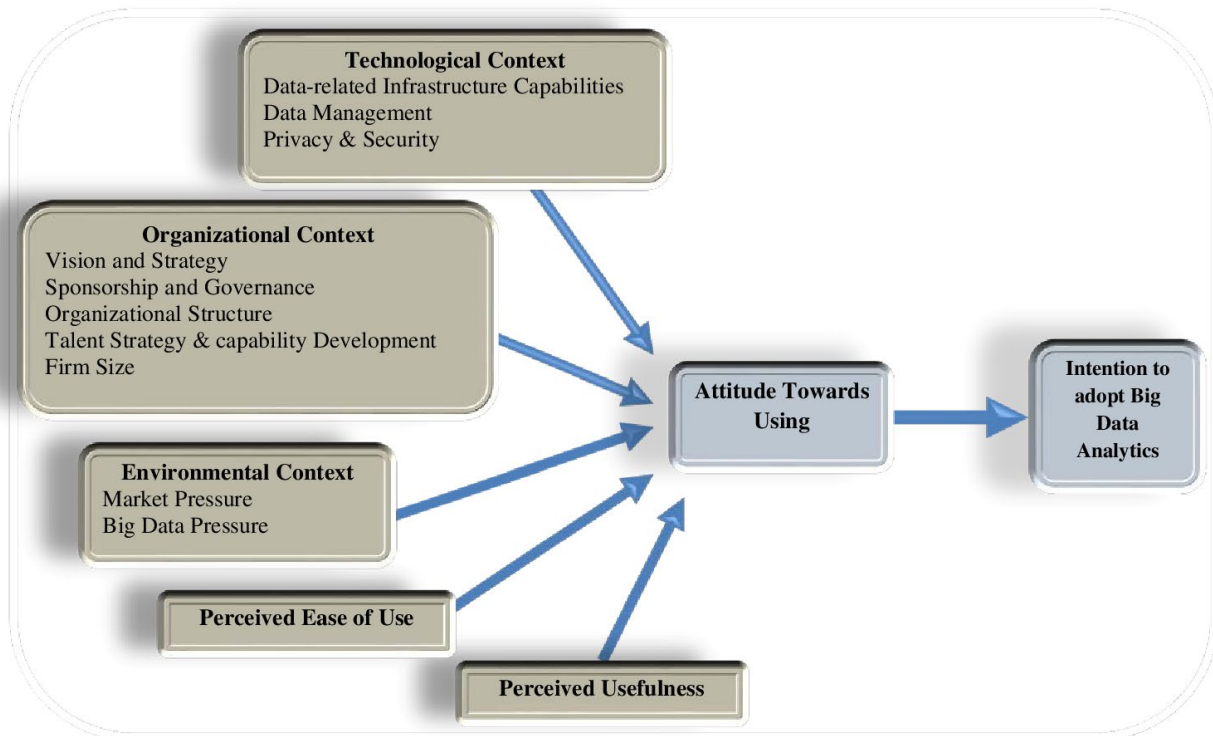


Fig. 1: Factors influencing the adoption of BDA.

an innovation relative to the value of a particular organization can significantly influence an organization's intention to adopt it. In general, a relative advantage refers to the level to which technology adoption is perceived to be dominant relative to other existing types of technologies used in the business, and the benefits that the company can derive from this.

The assumption that the technology will yield high results

raises performance expectations.

Factor No. 3: Quality control

This factor examines perceptions regarding attributes that are related to interpretation of customers' internal audit data, maintaining ethics and professionalism, legal/regulatory challenges, and external or third-party data.

Factor No. 4: Enterprises

This factor examines perceptions regarding attributes that

are related to customer IT controls, customer data, customer support and infrastructure robustness, as well as the size of the customer business.

It is indisputable that customers may have unusual sources of their data. For example, they may generate financial valuations of certain assets based on information provided by external social media sources. Nevertheless, understanding this data would be difficult, even with the use of DA /data analytics/. In addition, the size of the customers' business must also be taken into account as it influences the decision on whether DA /data analytics/ should be used or not.

Factor No. 5: External factors

Rapid progress in information technologies has greatly impacted the financial profession in many ways. In this regard, it would be more advantageous to transform traditional financial audit processes to a more technology-based audit.

Factor No. 6: Organizational factors

This requires time and investment in training.

Senior management is the level to which managers understand and embrace new technological capabilities. Enterprise decision makers are more likely to consist of a senior management group (team) and their commitment/support is necessary for successful adoption/acceptance of innovation. The senior management team facilitates the relationship between individuals and the adoption of innovations as the willingness to adopt is linked to their level of innovation.

Factor No. 7: Meeting certain standards

Attributes of this factor address a principles-based standard, collaborative work on standards, and the status of current ISAs /International Standards on Auditing/.

One of the key challenges in the use of DA is the implementation of quality control in the development or use of analytical tools. In addition, care shall be taken when assessing the reliability of analytical instruments.

In fact, the use of BDA should be extended to all levels of ministries so as it may be used as information for formulating effective programs.

BDA provides strategies and technologies for collecting, storing, transferring, analyzing and displaying vast amounts of structured and unstructured data.

Insufficient financial resources, lack of required skilled manpower, capabilities and IT infrastructure can hinder the adoption of BD, and hence these barriers need to be overcome through collaboration between BD providers and the government.

Providers need to increase their goodwill to gain the trust of enterprises and this can be possible through marketing in social media and recommendations.

Factor No. 8:

Variables that can affect performance - these are technological, organizational and environmental factors.

Under conditions of actual manufacturing activities, the capacity to use the information from data, information leakage, interference and other factors will have an indirect impact on manufacturing decision making.

Factor No. 9:

Companies considering the adoption of BDA face several barriers such as lack of knowledge, fear, resistance to change and the technology's own limitations.

With the trend of economic globalization, smart manufacturing has attracted much attention from both

academic environment and industry. Related underlying technologies make the manufacturing industry smarter. As one of the key technologies in artificial intelligence, big data-driven analytics improves the market competitiveness of the manufacturing industry by extracting the hidden knowledge value and potential capability of industrial big data, and helps enterprise leaders make wise decisions in various complex manufacturing environments.

3. CONCLUSION

In general, three factors related to technological, organizational, and quality control are perceived as being significant in motivating the use of DA.

Technological progress in the business environment influences the use of DA in practice.

The senior management support shall be in the form of sufficient financial and technical support, recruitment of appropriately qualified staff and provision of appropriate training for the existing employees, search for competent BD providers and allocation of adequate resources for BD implementation. It is important for the senior management to realize that the use of BD is a priority for the company and to encourage its use. The commitment of the senior management to the overall business activities is very important for the adoption of BD among industrial enterprises and ensures a high level of success of the implementation process.

REFERENCES

- [1]. Akter S., Wamba S. F., Gunasekaran A., Dubey R., Childe S. J. (2016). How to improve firm performance using big data analytics capability and business strategy alignment? *International Journal of Production Economics*
- [2]. Alles, M., & Gray, G.L. (2015). The pros and cons of using big data in auditing
- [3]. Akerkar, R. (Ed.). (2013). Big data computing. Crc Press
- [4]. Amankwah-Amoah J., Adomako S. (2019). Big data analytics and business failures in data-Rich environments: An organizing framework. *Computers in Industry*
- [5]. Arunachalam, D., Kumar, N., & Kawalek, J. P. (2018). Understanding big data analytics capabilities in supply chain management: Unravelling the issues, challenges and implications for practice. *Transportation Research Part E: Logistics and Transportation Review*, 114, 416-436.
- [7]. Brock V., Khan H. U. (2017). Big data analytics: Does organizational factor matters impact technology acceptance? *Journal of Big Data*
- [8]. Chen C., Choi H. S., Ractham P. (2022). Data, attitudinal and organizational determinants of big data analytics systems use. *Cogent Business & Management*
- [9]. Finney S., Corbett M. (2007). ERP implementation: A compilation and analysis of critical success factors. *Business Process Management Journal*
- [10]. Iranmanesh M., Lim K. H., Foroughi B., Hong M. C., Ghobakhloo M. (2023). Determinants of intention to adopt big data and outsourcing among SMEs: Organisational and technological factors as moderators. *Management Decision*
- [11]. Maroufkhani P., Iranmanesh M., Ghobakhloo M. (2023). Determinants of big data analytics adoption in small and medium-sized enterprises (SMEs). *Industrial Management & Data Systems*
- [12]. Tschakert, N., Kokina, J., Kozlowski, S., & Vasarhelyi, M. (2016). The next Frontier in Data Analytics - Journal of Accountancy. *Journal of Accounta*
- [13]. Sivarajah, U., Kamal, M. M., Irani, Z., & Weerakkody, V. (2017). Critical analysis of Big Data challenges and analytical methods. *Journal of Business Research*, 70, 263-286.