Big Data Usage in European Countries

Subjects: Information Science & Library Science

Contributor: Mirjana-Pejic Bach , Tine Bertoncel , Maja Meško , Dalia Suša Vugec , Lucija Ivančić

Big data refers to the vast amount of structured and unstructured data generated in the digital era. It provides opportunities for analysis, prediction, and optimization. In Europe, big data is being increasingly used by businesses, organizations, and governments to gain insights and make informed decisions. However, the adoption and utilization of big data technologies vary across different European countries due to factors like infrastructure, policies, regulations, data privacy concerns, and digital maturity. Presented study aims to explore these variations, providing valuable insights for policymakers, researchers, and businesses. It seeks to inform policy decisions, support business strategies, and enhance the understanding of big data in Europe.

big datacluster analysisdigital dividek-meansenterpriseindustryEuropequality

1. Introduction

Big data has emerged as a game-changer in the digital era, offering immense potential for businesses, organizations, and governments to gain valuable insights and make informed decisions. In Europe, the utilization of big data has taken center stage, with various countries witnessing its transformative power and reaping its benefits. As such, understanding the landscape of big data usage in European countries has become increasingly important. This introduction provides an overview of the growing significance of big data in Europe and highlights the need to explore its utilization across different countries. In recent years, the proliferation of digital technologies and the exponential growth of data generation have given rise to an abundance of valuable information. Big data encompasses this vast and diverse collection of structured and unstructured data, offering unprecedented opportunities for analysis, prediction, and optimization. European countries, as major players in the global economy, have recognized the potential of big data and its ability to drive innovation, enhance competitiveness, and fuel economic growth. However, there exists a significant variation in the adoption and utilization of big data technologies across different European countries. This disparity is influenced by factors such as infrastructure, policies, regulations, data privacy concerns, and the overall digital maturity of each nation. As a result, understanding the variations in big data usage becomes crucial for policymakers, researchers, and businesses alike. By exploring the current landscape of big data usage in Europe, policymakers can identify areas of strength and weakness, leading to the formulation of policies tailored to bridge the digital divide and promote a more equitable distribution of big data opportunities. Researchers can gain insights into the factors influencing big data utilization, as well as identify best practices and success stories that can be applied in other countries. Moreover, businesses can leverage this knowledge to make informed decisions about market expansion, investment opportunities, and customer targeting in different European regions. Therefore, this study aims to examine the usage of big data in European countries, map out the varying levels of adoption and implementation, and uncover patterns and trends that contribute to such differences. By doing so, it seeks to provide valuable insights that can inform policy decisions, support business strategies, and enhance the overall understanding of big data in Europe.

2. The Impact of Information and Communication Technologies and Big Data on Socio-Economic Progress and the Digital Divide

The evolution of Information and Communication Technologies (ICTs) over the past few decades has significantly contributed to global socio-economic progress. Countries with higher ICT adoption rates tend to experience improved economic outcomes. However, the aspiration for a digital society remains elusive for some countries, leading to a digital divide at both individual and enterprise levels. This divide, addressed at the 2003 World Summit in Geneva, refers to the disparity in access to specific technological infrastructures 1. The digital divide can also represent the psychosocial gap between those who embrace the digital revolution and those who reject it due to various personal and demographic reasons. While the digital divide has decreased for some technologies, new and emerging technologies contribute to a divide among enterprises. This is concerning as enterprises heavily rely on ICTs to enhance their competitiveness. One such technology is big data, primarily driven by the emergence of Industry 4.0. The concept of Industry 4.0 was initially proposed at the 2011 Hannover Fair and became a German strategic initiative in 2013. The fourth industrial revolution, facilitated by the development of the Internet of Things (IoT) and big data, has enabled the implementation of automation and artificial intelligence in industrial environments, making them "smart" ^[2]. Big data plays a crucial role in Industry 4.0 enterprises. Big data algorithms and technologies enable the discovery of new business insights and informed data-driven decisions, improving organizational performance and competitive advantage. Consequently, it is projected that 40% of ICT investment growth from 2012 to 2020 would be devoted to big data ^[3][3]. Big data refers to large amounts of structured and unstructured data, usually collected in real-time. Its complexity can be summarized by the 3V model: Volume, Variety, and Velocity. Machine learning or deep learning is an integral part of big data systems because they can learn from big data. This is crucial as it is nearly impossible for humans to generate any relevant insight from big data without machine learning. Machine learning on big data can help businesses detect and prevent various types of fraud, thereby increasing their security and reducing costs associated with computer crime. Advances have been made in various fields, such as weather forecasting, natural disaster management, medicine, biology, and physics. The benefits of machine learning and big data have been demonstrated in various industries, including insurance, chemistry, and energy. Big data is also used in the public services domain, where insights can foster innovations. Some additional implementations include public safety, smart health, smart grids, and eGovernment. In summary, the rise of ICTs and big data has significantly impacted various sectors, driving socio-economic progress, and shaping the future of industries and public services $\frac{4}{2}$.

3. Big Data Utilization in Europe: A comperative Analysis of Northern, Southern, and Eastern Regions

Northern European countries are leaders in the utilization of innovative industries, particularly in the domain of big data. Through an analysis of big data usage across various European countries, it was evident that these Northern European nations have established themselves as frontrunners in harnessing the power of big data for their enterprises. The data collected and analyzed in this study revealed a clear pattern of higher adoption and implementation of big data technologies in Northern European countries compared to their Southern and Eastern European counterparts. There are several factors that contribute to the success of Northern European countries in big data utilization. These nations have typically invested heavily in digital infrastructure, ensuring reliable and highspeed connectivity. They have also fostered an environment conducive to innovation, with supportive policies, initiatives, and funding opportunities for businesses and organizations to explore and harness the potential of big data. Additionally, there is a strong emphasis on education and skills development in these countries, creating a talent pool of data scientists and professionals well-versed in big data analytics. The study identified that certain industries, particularly information technology, are leading the way in the utilization of big data. This suggests that these industries have recognized the potential of big data and have made significant efforts to incorporate it into their operations and decision-making processes. The dominance of the information technology industry in big data utilization can be attributed to its inherent need for data-driven insights and analytics. These industries rely heavily on data for various purposes, such as improving customer experiences, enhancing product development, and optimizing business operations. As a result, they have invested in the necessary infrastructure, technologies, and human resources to harness the power of big data effectively. The research findings revealed that enterprises predominantly rely on internal big data experts for their big data initiatives. This suggests that the technical competence of their employees plays a crucial role in the successful utilization of big data. Organizations that have skilled and knowledgeable professionals in-house are better equipped to handle the complexities of implementing and managing big data projects. The reliance on internal big data experts can be attributed to the unique nature of big data analytics. It requires specialized skills in data management, data processing, statistical analysis, and machine learning techniques. Therefore, organizations that have trained their workforce in these areas are more likely to benefit from big data utilization. The notion that large companies are at the forefront of implementing innovative technologies, including big data. This suggests that larger enterprises have a distinct advantage in terms of utilizing big data, as they possess the necessary resources, talent, and capabilities to make informed decisions and invest in the right technologies. The dominance of large companies in big data utilization can be attributed to several factors. Firstly, larger enterprises tend to have greater financial resources, allowing them to allocate significant budgets towards big data initiatives. This enables them to invest in advanced technologies, such as data analytics platforms, machine learning algorithms, and storage infrastructure, which are essential for effective big data utilization. Secondly, large companies typically have access to a broader pool of skilled professionals. They are more likely to attract top talent in the field of big data analytics, as they can offer competitive salaries, career growth opportunities, and challenging projects. The availability of skilled experts gives these enterprises an advantage in leveraging big data by applying sophisticated analytical techniques and extracting valuable insights from vast amounts of data. Moreover, the research findings suggest that large enterprises have the ability to make informed decisions when it comes to selecting the right technologies for big data implementation. Their access to resources, market intelligence, and expertise enables them to evaluate different technological options and choose the most suitable ones for their specific needs. This strategic decision-making process ensures that these companies can fully leverage the potential of big data and gain a competitive edge in their respective industries.

For the future research it is utmost important to study the big data on an enterprise-level and provide more evidence on the efficiency of enterprises in using big data for tactical, operational, and strategic decision-making.

References

- 1. Sjaak Hubregtse; The digital divide within the European Union. *New Libr. World.* **2005**, *106*, 164-172.
- 2. Li Da Xu; Eric L. Xu; Ling Li; Industry 4.0: state of the art and future trends. *Int. J. Prod. Res.*. **2018**, *56*, 2941-2962.
- 3. Singh Hardeep; Singh Gurpreet; BIG DATA A REVIEW. *i-manager's J. Inf. Technol.*. 2017, 6, 36.
- 4. Jacky Akoka; Isabelle Comyn-Wattiau; Nabil Laoufi; Research on Big Data A systematic mapping study. *Comput. Stand. Interfaces*. **2017**, *54*, 105-115.

Retrieved from https://encyclopedia.pub/entry/history/show/119991