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Big Data and Big Data Analytics in Value Creation and Innovation

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ABSTRACT

Companies or organizations that want to continue to grow and develop in increasingly fierce competition need to innovate to create a competitive advantage. Big data has made it easier and more possible for organizations to make effective decisions thanks to the data-driven insights that big data analytics provides. Researchers and executive managers will focus more on data-driven decision-making and how to help businesses become data-driven by facilitating interactions between decision makers and the big data analytics pool. In this paper, the role of innovation in driving the optimization of big data and big data analytics aimed at creating value for the company's progress.

INTRODUCTION

In anticipating and following the development of an uncertain environment, organizations must be able to adapt and overcome any challenges and changes. For that, organizations need to make a breakthrough. This breakthrough is then called innovation. To be able to innovate requires a learning process. This is what then links innovation management or innovation management with organizational learning. Learning in an organization where every member wants to self-correct and remember to follow the development of science and technology will create innovations for the organization's progress. Furthermore, management as a science and art will orchestrate individuals applying these new ideas within the organization.

Industry and academia see innovation as an essential facilitator of competitive advantage for any company looking to stay competitive, sustainable, and growing. Most companies recognize the value of innovation and continue to invest more and more in it, but many of these projects fail to generate sufficient profits or competitive advantage. The problem that makes innovation less successful is not the discovery or production of new ideas but rather the proper management of the innovation process from concept to market success. (Lobo & Samaranayake, 2020).

Innovation has brought changes in many aspects of life, including innovation in technology and information that produces big data. Big data includes a collection of data that is very large and

complex, so it is inadequate if processed using conventional applications, so big data analytics (BDA) is needed, which is a tool or technology used to process big data. Big data can revolutionize corporate strategies and business models, increased marketing performance, product and service development, human resources (HR), operations, and other critical business processes. Companies can benefit from big data thanks to advanced analytical techniques and robust information technology. (Chen et al., 2015). Big data is all around us. Big data, enterprise analytics, and "smart" work and living environments have all become more prevalent in recent years. Whether using machine learning and web analytics to anticipate human behavior, consumer choices, search activity, traffic patterns, or disease outbreaks, big data is fast becoming a tool that can examine trends and predict their likelihood. (George et al., 2014).

Organizations or companies today use big data analytics (BDA), which is defined as the process of examining large amounts of data using advanced technology to uncover helpful information (e.g., hidden patterns, unknown correlations, and so on) to assist in making better decisions across business processes between functions or companies. Many organizations seem to be learning about the value of big data, the required information technology (IT) and analytical skills, the risks involved, and how to create an attractive business case for a significant investment. Consequently, the underlying mechanisms leading to the use of BDA in enterprises and the performance effects of such use require further examination (Chen et al., 2015).

The use of big data and BDA contains information that is useful for companies in making decisions, which can help create value for the company. This information is needed to create or add benefits to products or services that are used to meet human needs. Companies utilize information generated from big data to improve company performance. This improvement occurs through developing that information in business practices, product and service development, and external relations.

THEORETICAL BASIS

Big Data and Big Data Analytics (BDA)

Big data is described as high-volume (large-scale), high-speed (moving/streaming), and high-diversity (numeric, text, video, etc.) information assets that require creative and cost-effective types of information processing to enhance insight in decision-making (Chen et al., 2015). The Internet, mobile transactions, user-generated content, social media, and content created intentionally through censorship networks and corporate activity such as sales inquiries and purchase transactions are all significant data sources. Due to the increased capacity to acquire large volumes of data and apply more sophisticated analytical tools to large data sets, big data analytics has recently become a prominent potential. Companies' new capacity to collect large (and diverse) data and apply robust analytical approaches to that data allows them to automate highly complex choices that previously depended (mainly or entirely) on human judgment and intuition (Chen et al., 2015).

Because it can provide information about customer preferences, feedback on the performance of a company's products and services, and insight into upcoming trends, big data is critical to the digitization of the enterprise environment. From a resource point of view, this means that big data may be a valuable resource that is difficult for competitors to duplicate or replace. As a result, businesses across multiple industries are increasingly exploring digitization and big data analytics to help make better business choices and develop better goods and services (Cappa et al., 2021).

Big data can be categorized as extensive public, open, or private data, depending on who owns and manages it (George et al., 2014). Individually generated data is referred to as big public data and is used by public bodies for research reasons. This category contains data obtained by municipal organizations from public Wi-Fi services and public transport, both used in decision-

making by public organizations. Open big data, on the other hand, is available to anyone interested and is often non-tradable. This category contains the World Bank's extensive data on global economic and institutional trends, which are collected and distributed. Companies generally develop big personal data using proprietary platforms. The data is then stored and utilized for commercial purposes by private companies. Interaction with clients is the most common source of extensive personal data available to businesses because it always happens (Cappa et al., 2021).

There is a growing consensus among practitioners that "big" is no longer the defining criterion but rather "intelligence" or insight that a fair volume of data can provide. The subtle nature of data, which shifts attention away from the number of participants and toward detailed information about the person, is the distinguishing feature of big data (George et al., 2014). The use of large-scale data to predict human behavior, whether "big" or "intelligent" data, is gaining popularity in business and government policy and in scientific fields where the physical and social sciences meet.

Big data, on the other hand, can be expensive for businesses. The larger the data set, the more storage space is required, and the processing time and complexity of data analysis increase. Other big data cost damages a company's reputation caused by improper digitization methods. Therefore, companies must recognize the need for a more detailed and critical analysis of the fundamental premise that big data always benefits businesses (Cappa et al., 2021).

Big data is a generic phrase for a collection of data sets that have grown in size and complexity to the point where they are challenging to collect, analyze and manage promptly using the usual data processing software and available data management tools. As a result, Big Data Analytics (BDA) or big data analytics is seen as a significant difference from business intelligence tools in general (Chen et al., 2015). It's important to understand that different individuals associate big data and analytics with different specific conceptions. Significant improvements in BDA technology that analyze crucial business data to help companies better understand their businesses and markets and make timely business choices have been driven by the prospect of data-related analytics across a wide range of companies. BDA emphasizes business-centric techniques and processes that can be used for various high-impact applications such as e-commerce, market intelligence, e-government, healthcare, and security, in addition to revolutionary data processing and analytics technologies (Chen et al., 2015).

Although a BDA is still in its early stages of development, the literature suggests that what constitutes a BDA for many organizations varies depending on the organization's ability to manage data sets and the capabilities of the applications used to process and analyze data sets in various business domains (Chen et al., 2015).

Innovation

Companies need new strategies oriented to transformation and continuous innovation through experimentation in maintaining their existence in the competition (Chanal, 2004). Innovation is broadly characterized as a new technology, service, or process to improve individual and organizational performance (Lobo & Samaranayake, 2020).

Innovation is an idea, idea, or practice that is new in creating or updating products, goods, and services. A field of science related to innovation management is called innovation management. Companies must continue innovating in developing their business products or services in an ever-changing business environment and in the face of competition. One of the goals of innovation is to adapt to the times.

Senior executives must address innovation as one of the essential components of competitiveness for their companies to survive (Teece, 2017). Due to factors such as shorter product life cycles and the importance of speed of products to market, the way companies approach innovation is changing. Generally, the best ideas do not always emerge from within the

company's walls, prompting companies to apply open innovation techniques (Chesbrough & Crowther, 2006).

Creating a new system or innovating is not an easy thing to do. Since the entire process from inception to commercialization is filled with uncertainties, turning abstract ideas into actual business activities is very difficult. Among the many unknowns that inevitably accompany innovation are whether the original idea is technically feasible, whether the right people can be hired and retained, whether the proposed product can be developed and tested without financial and emotional exhaustion, and whether the market is ready for it, and whether new products can be produced and distributed cost-effectively. Furthermore, this uncertainty is difficult to overcome because it is usually unique to the particular conditions of the invention (Sharma, 1999).

The company uses an "Experiment & Explore" procedure based on the premise that variance is the key raw material for innovation and organizational change, allowing employees at all levels to have significant autonomy and choice to maximize the possibility of developing ideas with original potential. The freedom to experiment and explore will enable ideas to establish without being constrained by strict judgments, which would limit creativity and truly inventive thinking (Sharma, 1999). Innovation can support individuals in exploring resources before using them, planning resource use, finding aids, using resources, protecting resources, sharing and reusing resources, paying for resource use, maximizing value creation from resources, using resources sustainably, and becoming a resource for other individuals and the environment (Pedersen, 2020).

Value Creation

Value creation for customers arises with new combinations of resources to create new products, services, or production methods. Chesbrough et al. (2018) define value as all the perceived consequences arising from the deployment of resources in a process. Customers determine perceived use value based on their view of the usefulness of the goods being sold. Customers' opinions about the value of a product are influenced by their ideas about the product, requirements, unique experiences, desires, and expectations (Urbinati et al., 2019).

Every commercial enterprise's goal is to generate or generate value for all its stakeholders. It is appropriate to state that value is created for the enterprise whenever the benefits outweigh the costs or whenever the costs outweigh the benefits. (Urbinati et al., 2019). Businesses can generate new value when they innovate or find new ways of doing things by leveraging new processes and technologies. Incremental innovation creates new value by improving something existing or changing an existing form or technology to fulfill a different function (Urbinati et al., 2019). Value creation can also be defined as a process of changing one or more objects, such as an organizational process or behavior. The purpose of this transformation is to influence public values and overcome critical social challenges. An important aspect of value creation in open innovation is that solutions rely on information from inventive external assets as well as internal expertise (Pedersen, 2020).

Building a Proposition

Product innovation is an integral part of the main supporting factors for creating value for customers (Torres de Oliveira et al., 2021). The old vertically integrated research and development strategy, used by most companies in the late 19th and early 20th centuries to create breakthrough technologies and dominate market positions, is no longer the standard. To achieve competitive advantage and create value, creative organizations in many industries are currently employing tactics that combine external resources with internal assets to accelerate innovation and bring it to market. (Chesbrough & Crowther, 2006).

We see the role of innovation in driving extensive data optimization to create value for the company's progress. In line with previous research (Cappa et al., 2021), we argue that big data may benefit a company's long-term success when it serves as a unique resource for creating and capturing value. According to research on open innovation, value generation and capture from big

data depend on benefits that outweigh the costs of collecting, storing, and exploiting these resources. (Chesbrough et al., 2018).

Value creation refers to the value associated with significant data insights that contribute to developing better goods and services (Urbinati et al., 2019). Companies can generate value by collecting large amounts of data containing several types of information per observation, which can then be stored for future internal use or sold to outside companies. In addition, companies can extract value from the data they collect by devoting significant internal resources to analyze it and correctly draw business insights and choices. (Cappa et al., 2021).

Big Data Analytics (BDA) is essential in creating a company's competitive advantage. We, therefore, suggest that BDA has the potential to influence the value creation process with its ability to turn big data into useful information for companies. In line with this argument, Chen et al. (2015) state that companies can develop information processing capabilities that enable them to interpret and combine information gathered from multiple sources and direct this synthesized information to appropriate decision makers. BDA is a revolutionary approach to sound decision-making in organizations that can generate change in transforming and supporting the circular economy (CE)(Cloud et al., 2021). Based on the arguments that have been presented, we propose:

Proposition 1: *Innovation drives extensive data optimization in value creation*

Proposition 2: *Innovation drives Big Data Analytics optimization in value creation*

CONCLUSION

Innovation in information technology has produced a helpful product, namely big data. Big data includes an extensive and complex set of data, so it requires Big Data Analytics (BDA) to be able to process data into information that is ready to use. This information can be developed to assist company executives in making decisions that are useful in creating value for the company. This information processing makes it possible for stakeholders to interpret and combine information gathered from various sources and to direct this synthesized information to appropriate decision-makers. With the proper decision-making, it is expected to provide value creation that is beneficial to the growth and performance of the company.

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