Logistics Business Model Strategies in Facing Changes in Big Data and Blockchain Technology: A Business Model Canvas Approach

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Article Info

ABSTRACT

Currently, the world is undergoing a transformation towards the era of digitization and automation, which serves as a key element in business competition strategies, including in the logistics sector. The use of data for organizational decision-making has become an integral part of digitization and automation. Big Data and Blockchain technologies are now being applied in various business sectors to enhance the efficiency of business processes and impact business models, creating new transformations that align with global business developments. These changes are analyzed both internally and externally using the Business Model Canvas (BMC). A SWOT analysis of the changes in the business model is necessary to provide a detailed depiction of the new business processes. The results of the analysis indicate that: first, technological advancements, especially in Big Data and Blockchain, continue to disrupt businesses to improve optimal performance; second, the implementation of Big Data and Blockchain results in both internal and external changes related to intra- and inter-organizational relationships; third, a SWOT analysis can detail the advantages of Big Data and Blockchain technologies in the business sector, particularly in logistics.

1.   INTRODUCTION

Indonesia is currently heading towards the era of digitization and automation, a pivotal shift in business competition strategy, including in the logistics sector. The implementation of digitization and automation involves the use of data as a foundation for organizational decision-making. One of the main challenges faced today is the effectiveness of managing abundant and complex data to be optimally utilized by companies[1].

The characteristics of this abundant data are influenced by advances in information technology connected to the internet, such as smartphones, CCTV, RFID, and the like. The diversity in the complexity of data, ranging from text, images, sound, to video, poses a unique challenge in its management. The concept of Big Data is closely related to three dimensions: Volume, Velocity, and Variety[2]. Therefore, companies need

to leverage these three aspects to enhance their business capabilities, create efficient business processes, serve customers, and ultimately shape a business model that aligns with the development of the business world. [3].

Acquired skills are typically validated through qualifications, often in the form of digital certificates awarded by organizations upon completion of training. These certifications undergo verification by audit staff to ensure their authenticity[4]. While the entire ecosystem relies on trust, precise verification protocols can be established with the aid of blockchain technology[5].

The second challenge to overcome is how to enhance the effectiveness of the working system within a company or between companies. The consensus at present is that having a wealth of information can lead to better performance. In the midst of this development, Blockchain technology is beginning to play a significant role. With Blockchain, each process or movement is broken down into blocks, and each transaction is documented every time it changes hands[6]. By linking these blocks together, all parties can see who is involved in the process and trace its details specifically. This approach creates a permanent digital history as a product moves through the supply chain from start to finish. The goal is to create one version of the truth, connect information, provide transparency about all parties involved in the supply chain, and identify how they participate in the flow of goods or services. It is crucial to note that this technology is not owned or controlled by a specific trading partner but is available to all involved parties. [7].

1.1. Big Data]

Big Data is a new technology for managing, analyzing, and visualizing rapidly growing data faced by companies and society (Bollier, 2010; Bryant et al., 2008; Brown et al., 2011). Big Data Analytics (BDA) refers to technology and frameworks designed to rapidly store, convert, transfer, and analyze a large amount of continually updated data, directly varied, structured and unstructured, for commercial and social benefits [8]. BDA has evolved from large database management systems to cloud services to process and analyze data more economically, effectively, and easily for user manipulation (Baer, 2011; Borkar et al., 2012). Major global data vendor companies include IBM, Oracle, SAP, EMC, Teradata, and SAS. The solutions currently offered by these vendors involve Data Warehousing, Data Mining, Business Analysis, Business Intelligence, Data Visualization, Decision Support, Automation Interfaces, and the like[9]. Big Data has three main features: volume, speed, and variety (Russom, 2011). Most past discussions focused on storing volume data. Speed and variety are crucial in competitive differentiation. Variety refers to various data formats, ranging from sortable structured data to unstructured data such as images, music, videos, essays, and discussions[10]. Compared to structured data, unstructured data provides a better reflection of reality for making important decisions (Adrian, 2012; Cohen et al., 2009). Another feature is speed. In a business environment where every second counts, businesses must collect and analyze data promptly to make critical decisions faster than their competitors. By processing large volumes of rapidly changing information that must be processed instantly, businesses can turn seemingly useless data masses into economic value [11].

1.2. Blockchain]

Blockchain is a distributed digital transaction ledger that cannot be manipulated due to the use of cryptographic methods (Pilkington 2016). This brief explanation includes three key properties of Blockchain: decentralization, verification, and immutability. Distributed systems, such as Blockchain, offer advantages compared to centralized architectures by providing the same verified information to all network members[12]. This fosters trust among parties by eliminating the need for trust. Blockchain can record asset transfers between two parties without requiring a trusted intermediary. Such assets may include digital currency, carbon credits, or other forms of ownership [13].

1.3. Business Model Canvas (BMC)]

The history of the Business Model Canvas originated from a PhD dissertation in 2000 and evolved into the Business Model Canvas we know today. Its application spans various areas within an organization[14]. The majority of survey respondents use the Business Model Canvas to develop new businesses, launch new products or services, or modify existing business models and strategies. The Business Model Canvas is also widely adopted among academics, including at top business schools like Stanford, Harvard, and IESE[15]. Students learn to apply the canvas in strategy and innovation through MBA and Executive programs, applying this knowledge to their respective organizations. More users are utilizing the Business Model Canvas to detail current and future strategi. The Business Model Canvas comprises nine basic components of a business model,

positioned on the canvas to visualize relationships between different issues. This aids users in mapping, discussing, designing, and creating new business models[16]. Generally, these components can be divided into products on the left and the market on the right, with the value proposition split into two parts[17]. On the right side, there is the 'Customer Segments,' encompassing everyone or every organization that will create value, including users and customers. Each segment has a specific 'Value Proposition' covering product and service bundles to create value for customers. 'Channels' describe interactions with customers and how to deliver value, while 'Customer Relationships' detail the types of relationships formed with customers [18]. Closing the right side of the canvas, 'Revenue Streams' explains how and the pricing mechanisms. On the left side, crucial business assets are displayed in 'Key Resources' directly beneath 'Key Activities,' which are things that need to be done well [19]. 'Key Partners' are those who help leverage the business model as it's impractical to have all key resources or perform all key activities independently. By understanding the business infrastructure through the Business Model Canvas, we gain an idea of the 'Cost Structure.'
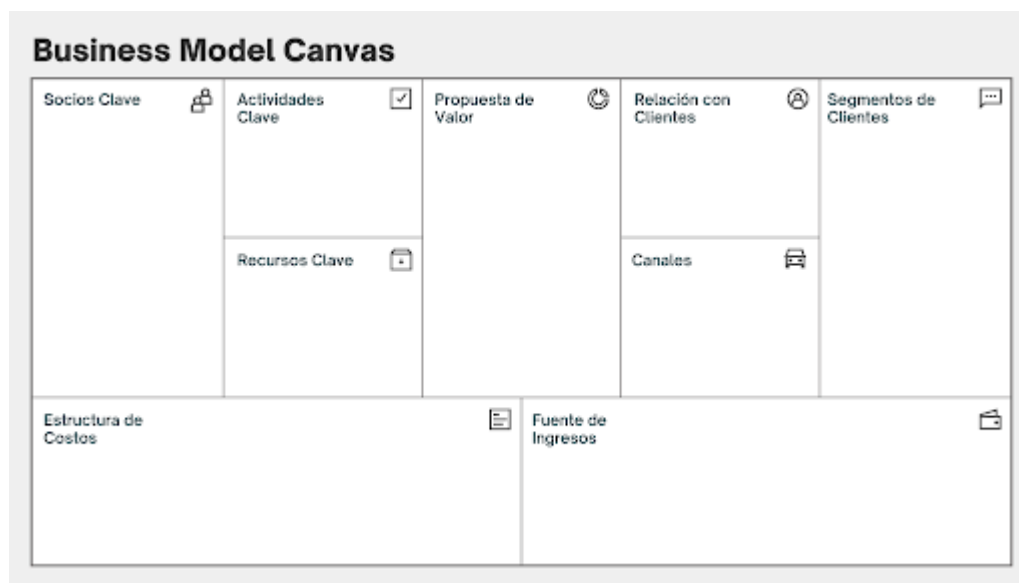

Figure 1. Business Model Canvas (BMC) Framework

2.   RESEARCH METHODS

The researcher will identify changes in the internal and external working systems found in the Business Model Canvas (BMC) to understand the impact of using Big Data and Blockchain [20]. After identifying changes in the internal and external working systems of BMC, the researcher will analyze them using the SWOT method, specifically focusing on the logistics sector [21]. The SWOT analysis aims to identify the strengths and weaknesses of an organization and its ability to cope with changes in the business environment. SWOT helps evaluate the company's business model.

2.1.   Research Type

The research applied in this study is descriptive qualitative research, where the effort is made to collect data, critically analyze the gathered data, and draw conclusions based on the facts during the research period (Sugiama, 2008).

2.2.   Subjects and Objects of the Study

The subject of this study is the BMC workflow. In this research, the object of the study refers to the Business Model Canvas influenced by Big Data and Blockchain Technology.

2.3.   Data Sources

The data sources are derived from secondary data. In this study, books, journals, and internet data will be utilized as secondary data sources. Illustrates the different functions of blockchain when applied for educa-

tional purposes [19]. The figure depicts various functions of blockchain when involved for educational purposes [20]. Blockchain technology involves three basic concepts: transactions, blocks, and chains. Transactions are ledger operations, such as entries or item deletions, which always lead to changes in the ledger's status; blocks record the outcomes of all transaction data over a period; the chain is a chronological sequence of blocks reflecting all changes to the ledger's status. Some higher education institutions have adopted blockchain technology to design innovative learning solutions [21]. Some studies have proposed frameworks for blockchain-based storage and verification of educational records and academic achievements [22]. For instance, MIT has developed a digital learning certificate system using blockchain technology [23].

3.   RESULT AND DISCUSSION

In implementing Blockchain, the main principle is a shift from a centralized system to a distributed one. The centralization approach has its main advantage in terms of control [24]. Companies can manage information and messages delivered to customers, facilitating collaboration with other departments or divisions. However, the drawback of a centralized structure lies in the substantial resources needed to build a comprehensive infrastructure, starting from scratch. Another prominent disadvantage is the slow responsiveness to changes, which does not align with the rapid pace of digital technological advancements [25]. This concept is illustrated in Figure 1. The implementation of Big Data and Blockchain technologies in the logistics sector, as depicted in Figure 4 below, will have various impacts, including: (1) fast and secure access to end-to-end supply chain information, serving as a single source of truth; (2) authenticity and verification of digital documents; (3) reliable cross-organizational workflows; (4) enhanced risk assessment and reduced intervention; (5) significantly lower administrative costs and the elimination of expenses related to the physical movement of paper across international borders.

Figure 2. . Application of Big Data and Blockchain in Logistics Business

4.   CONCLUSION

The application of BMC and SWOT analysis can be summarized as follows: First, current technological advancements, especially in Big Data and Blockchain, will continue to disrupt businesses for optimal performance. Second, the implementation of Big Data and Blockchain indicates positive changes both internally and externally, related to relationships within and between organizations. Third, SWOT analysis can elaborate on the advantages of Big Data and Blockchain technologies in the business sector, particularly in logistics.

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