

BIG DATA AND METAVERSE TOWARD BUSINESS OPERATIONS IN INDONESIA

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ABSTRACT

The rapid growth of information and technology recently brings new opportunities in business operational. An optimal used of resources may leads into business efficiency and therefore minimizing operational cost. Moreover, new opportunities are also revealed by creating more innovations in business. Metaverse gain its popular name firstly in public awareness in October 2021, when Facebook, Inc. renamed it "Meta" and announced a multi-billion-dollar investment in Metaverse technology. In Indonesia, the concept of big data and metaverse technology is still growing and keep attracting attention of many researchers, academics, and business practitioners. Besides the promised opportunities, these technologies are facing several obstacles in adoption. Lack of available talents and infrastructure still two dominant topics to be discussed. Fortunately, Indonesian government shows a serious effort on pursuing a better infrastructure and available talents through providing supports and quality training.

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1. INTRODUCTION

Big data as a concept was firstly introduced by META Group analyst Doug Laney in his 2001 research report, followed by subsequent research reports (e.g. T. Zhu, S. Xiao, Q. Zhang, Y. Gu, P. Yi, 2015) Doug Laney describes Big Data as a data phenomenon with 3 characteristics such as volume, velocity, variety (3V). Besides, Özköse (2015) serving the character of Big data in 5V; volume, value, velocity, variety, veracity, and velocity. Then Milne and Watling noted the Big Data character which was formulated by GSR Technologies as 5V + C (3V + Variability, Veracity + Complexity), and which was formulated by Kitchin as 3V + 2R (Resolution, Relational) + E (Exhaustive) + F (Flexible) (Watling, 2019). Besides, Prof. Snijders, defines Big Data as a term that includes all data sets with a sufficiently large level of size and complexity to make data sets difficult to capture, analyze and process in a proper method or techniques using data analytic tools and traditional data analysis applications (Gaps & Science, 2012).

The rapid growth of big data can be utilized in economic and business development in Indonesia. Sectors that use big data technology in the economic and business fields are E-commerce, public transportation, finance and banking, telecommunications, e-health and the creative economy. In addition to utilizing big data technology, the telecommunications and e-commerce sectors are also data producers. The creative economy is a sector that is still widely open for business actors to enter this sector. Apart from not having so many actors in this sector, the scope of this sector is also quite broad.

The rapid growth of big data can be utilized to increase economic and business growth, especially in Indonesia. There have been many companies as well as large businesses and small business actors who have taken advantage of this big data technology. Although the use of 'Big Data' may complex and expensive, small businesses with small capital still be able to utilize its benefits as long as knowing its business objectives, thus facilitating the identification of the data needed.

The utilization of big data may leads into new opportunities. Therefore, the benefit can be leveraged in developing a metaverse technology. With an adequate of data quality, a digital twin of a business in

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metaverse can be operated optimally in reaching new customers and serving existing customers and eventually maximizing profit. However, this study has been scarcely analyzed and studied specifically in Indonesia. In this study, the researchers describe how Big Data and metaverse are leveraged in business operations in Indonesia including obstacles and opportunities.

2. METHOD

Business in general is describing an activity and institution that produces products and services in daily life (Amirullah, 2005). Moreover, according to Bukhori Alma, business is a total number of businesses covering agriculture, manufacturing, building, distribution, transportation, communication, service and goods businesses and government, which are engaged in making and marketing goods and services to consumers (Alma, 1993). According to Louis E. Boone, business (business) consists of all activities and businesses to seek profit by providing goods and services needed for the economic system, some businesses produce tangible goods while others provide services (Boone, 2007).

Indriyo Gito Sudarmo said there are several types of businesses, to make it easier to know the groupings, they can be grouped as follows: (Sudarmo, 1996)

- a) Extractive, namely a business that carries out activities in the mining sector or excavates mining materials contained in the bowels of the earth.
- b) Agrarian, namely a business that runs its business in agriculture.
- c) Industry, namely businesses engaged in industry.
- d) Services, namely businesses engaged in services that produce intangible products.

While business operations are the sector that is responsible for the quality of products and costs of a business or company. In general, business operations are efforts to regulate and optimize the use of resources ranging from human resources (HR), marketing operational business strategies, tools (tools), costs and materials, in order to produce a product or service.

Definition and Study of Big Data

Unlike traditional data, the term big data refers to large growth, both structured and unstructured and requires the latest technology to take advantage of it. Big data can also be interpreted as data that continues to flow quickly, complex and complicated that is used to analyze conventional database management with analytical systems (Haider, 2014). With Big Data (BD) as the data set, the Big Data Analytics (BDA) is a data utilization business in the form of visualization, prediction, simulation, modeling for achieve certain goals. According to the European Union Agency for Network and Information Security (ENISA), BDA refers to the entire data management lifecycle for collect, organize and analyze data to find a pattern, to deduce a situation or circumstances, to predict and understand behavior. It is necessary to know what roles can be handled the new technology is in the decision-making problem regarding zoning in the context of SCM. Because of that understanding of the extent to which the role of BDA, especially in the aspect of data collection forming data set in determining the number, size, and location Logistics facilities are a necessity for actors in the world business and actors in government (Rayat, 2019).

With reference to this definition, it can be concluded that the main characteristics of Big Data include three things – usually abbreviated as 3V – namely volume, velocity, and variety. Volume is related to the amount of data that must be managed at a super large size. Velocity relates to the speed of data processing which must keep pace with the rapid growth in the amount of data. While variety refers to the characteristics of very diverse data sources, both those from structured databases and also from unstructured data. (Maryanto, 2017)

Big Data is a collection of large amounts of data then processed with a sophisticated system so as to make the settings more systematic and light. Talking about Big Data is really about volume. However, it is not the number that is important, but the action or processing with the data that is important. At today's global level, the volume of data that has been processed and stored is almost unimaginable. Data continues to grow non-stop every day. A simple example, when many people post something on social media. With that in mind, Big Data has a high potential for gathering key insights and business information.

Metaverse

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Metaverse, combination of the prefix “meta” (implying transcending) with the word “universe”, describes a hypothetical synthetic environment linked to the physical world. The word 'metaverse' was first coined in a piece of speculative fiction named Snow Crash, written by Neal Stephenson in 1992 (Joshua, 2017) Stephenson defines the metaverse as a massive virtual environment parallel to the physical world, in which users interact through digital avatars. Since this first appearance, the metaverse as a computer-generated universe has been defined through vastly diversified concepts, such as lifelogging collective space in virtuality, embodied internet/ spatial Internet, mirror world, an omniverse: a venue of simulation and collaboration, (Stentoft, 2019).

3. RELUST AND DISCUSSION

3.1 Big Data in Indonesia

The growth of internet users, social media and electronic transactions are currently experiencing an extraordinary rate of increase. This increase is of course due to the connection of mobile phone devices (cellular phones) with the internet network. Internet-based activities such as social media, online transactions, Internet of Thing's (IoT) real-time sensor records, official government data and so on with the rapid growth of big data, even in 2020 the amount of big data is expected to exceed the number of stars in the universe (Bayer, 2017).

There are several reasons why the development of big data and the metaverse is so significant. According to Hilbert and Lopez, there are three main things that trigger the development of Big Data technology (Lopez, 2011):

a) The rapid increase in data storage capabilities.

Data storage capabilities have grown significantly

b) The rapid increase in the ability of data processing machines.

Along with the rapid development of hardware technology, the computing capacity of computer machines/equipment has also increased very sharply.

c) Availability of abundant data.

Companies from various sectors in the United States have at least 100 terabytes of data. In fact, many of these companies have more than 1 petabyte of data. The role of Indonesian big data is important in the business world because it has high-volume, high-variety, and high-velocity properties, which means that the data is very abundant, very diverse, can be obtained in real-time, and a lot of information will be obtained. of the big data. The role of big data in this business world is to understand market conditions. Market conditions will easily change at any time so that with big data, it is expected to be able to see changes in market trends quickly. The thing that makes this market trend change is due to changing consumer buying behavior. In the big data business, it is also possible to find out which products are sold the most and can produce products in the future that are in line with trends.

Big data plays a role in controlling the reputation of an online business that is owned. The tools in big data can perform sentiment analysis, so business people will be able to see how much feedback there is about who has responded to the company. The last role is big data will be able to understand customers well. Big data will be able to know what customers want and provide the best service to them. By using big data, companies will be able to minimize customer complaints and complaints.

Although Indonesia's big data has many benefits, in reality there are several obstacles that make its implementation not as expected. One of the biggest challenges actually come from the readiness of human resources. In fact, to be able to read the data accurately this analysis is prominent. In addition, the next implementation obstacle is that it arises from the internal big data party itself where the number of scientists and experts who are able to understand big data well is still very limited so that influence the acquisition price of such talent. But fortunately, currently there are several credible vendors who offer big data accompanied by competent big data consultants. With the help of experienced consultants, companies will be able to use big data more optimally (Soltius.co.id, 2018).

Big Data helps companies to innovate by studying the relationships between people, institutions and entities. From this relationship, companies can use data insights to make decisions about financial and strategic considerations. Companies can find new insights about trends and what customers want in a product or service. Especially in terms of marketing, this is important, because the use of Big Data is able to provide accurate results about various customer ratings of a product.

Moreover, digital activities now dominate the agenda of every person or organization. Therefore, it is important for today's executives to know Big Data in order to find new strategies to keep interacting with customers. Big Data is considered capital, because it is the key to solving problems quickly, accelerating innovation, and driving company growth.

Specially in this era of the covid 19 pandemic, the use of Big Data also affects the way companies survive during the pandemic. Through a marketing strategy that now everything is done digitally, of course, making time more effective, saving budgets, and reducing the impact of being exposed to the COVID-19 virus. It is also supported by the new habits of people who carry out some of their activities digitally, such as transacting, shopping, and even looking for entertainment. Data transfer that occurs at any time is useful for companies to be able to see market conditions in a short time, then can find out how the condition of customers or society as a whole (Acerid. 2017).

Given that the business world has a high and sharp competitive process, companies need new, more innovative strategies. Of course, the use of big data can provide benefits in business. In addition, Big Data can also determine the decision making of executives. From the various information received, the company's business decisions or strategies for the future are no longer based on forecasts. Everything is certain, because the data is decisive (Acerid. 2017).

Companies engaged in the business sector have a primary orientation on achieving the highest possible profit margin (profit oriented). Various important information can be generated from Big Data that can support the decision-making process for company leaders as follows. There are several things that big data and metaverse impact on business operations (Kominfo, 2015) :

- a) Knowing the public's response to the products issued through sentiment analysis on social media.
- b) Helping companies make more precise and accurate decisions based on data
- c) Help improve the company's image in the eyes of customers. d. Business planning, by knowing customer behavior such as in telecommunications and banking companies
- d) Knowing market trends and consumer desires.

In the public service sector, the use of big data services. Companies or institutions in the public service sector usually have a primary orientation on achieving client/customer satisfaction. Resource Big Data can contribute by presenting various valuable information as follows: (Kominfo, 2015)

- a) Obtain feedback and public response as the basis for policy formulation and improvement of public services. The feedback can be obtained from the government service information system or from social media.
- b) Creating integrated services with special segments so that services can be more effective and efficient.
- c) Finding solutions to existing problems, based on data. For example: analyzing weather information and agricultural information related to soil fertility data, the government can determine or recommend the types of plant varieties planted by farmers in certain areas and at certain times.

In the application of big data, the following areas can be used in utilizing big data, especially those related to the economy and business. Those fields include:

- a) Finance and stock market

Big Data can be a very useful tool in analyzing very complex stock market movements and aid in making global financial decisions. Big data can also be used by people with no background in stock market and finance knowledge to predict security prices by drawing ideas from new sources (Mukherjee, Samiddha and Shaw, 2016)

- b) Telecommunications industry

Telecommunications industry is an industry that has a global network. In improving customer service, the concept of big data can be applied very well. Existing data such as call detail records, web services, email and social media are some examples of data that can be accessed by telecommunications operators.

- c) Public Transportation

Many public transportation companies have used RFID (Radio Frequency Identification) and GPS applications to find out the position of their fleet and retrieve data from their fleet such as the number of passengers, travel time for various times, to what problems are faced by each fleet route. the.

- d) e-health services

The benefits of big data in e-health electronic health services such as analyzing laboratory results uploaded by patients, checking patient symptoms online and being able to adjust the prescription to be given. This is very useful for patients and the hospital, especially in reducing the cost of health services.

e) Public Utilities

The utility fields that are very vital for the community such as gas, electricity, water and fuel can take advantage of this big data technology. Data about the time when the usage is the most, the trend of increasing the number of requests, as well as data on the feasibility of existing utility infrastructure.

f) E-commerce

The concept of e-commerce is commerce whose transactions use intermediary electronic devices that are connected to each other in a virtual space. E-commerce has a significant positive impact on businesses, consumers and society. These impacts will ultimately encourage regional economic growth, either directly or indirectly, but can also lead to economic disparities, especially in areas where there are no electricity and telecommunications facilities. Utilization of big data in the world of e-commerce for business people can find out product trends favored by the public, customer clustering based on region, age, gender and so on.

g) Creative economy

Creative economy fields such as music and film can take advantage of big data technology. Data such as elements and themes that can make a music liked by the public can be obtained by implementing data mining (Ousous, 2018)

The benefits of Big Data technology have been widely felt in various sectors. Companies engaged in the business sector can take advantage of the valuable information generated by Big Data to optimize the decision-making process decisions, so that the target of maximizing profit can be achieved. Meanwhile, institutions engaged in public services can use the output of information from Big Data to maximize the level of service satisfaction to their clients/customers.

3.2 Metaverse Development in Indonesia

Indonesia's Ministry of Communication and Informatics (Kominfo) on behalf of Indonesian government is supporting a company established by locals to jointly develop the Indonesian Metaverse ecosystem. This regional cooperation should be a promising impetus for future technological and economic development. Metaverse Indonesia has begun to build from the sectors in which the user ecosystem is most adaptable to adopting digital innovation.

One of the national subsidiaries developing Metaverse intensively in the country is the WIR Group, which presented the Metaverse Indonesia prototype to the global community at the G20 President's culmination event in Bali in November 2022. To do. To develop Metaverse in Indonesia, the company encourages participation in collaborations with global and domestic companies, including partnerships with Meta and Microsoft to develop hardware for augmented reality and virtual reality eyeglasses.

Leveraging big data technology in metaverse is believed able to optimize the decision-making process, so that the target of maximizing profit can be achieved. Meanwhile, institutions engaged in public services can use the output of information from Big Data to maximize the level of service satisfaction to their clients/customers by personalizing the message and treatment to targeted customers.

4. CONCLUSION

Big data and metaverse are possibly used for many fields in terms of utilization, especially in increasing the efficiency of business operational. Big data utilization and metaverse can be beneficial for understanding behavior, needs, and wants of targeted consumers. These can be conducted through collecting customer information data from involved activities such every transaction that occurs. This information later can be used as a weapon to get closer and identifying consumer needs. Big data and metaverse can be a huge improvement in business operational. Moreover, it will also give lot more opportunity and options in business model to create a new value to help business practitioners in their activities. However, there are also obstacles that need to be solved and cleared such as internet infrastructure, technology related to VR or AR, human readiness to adapt and etc. Moreover, health concern

of metaverse users such as psychology and physical health still under study of many researchers. They are working on how to reducing or even remove the bad effect of such technology. Some researchers are concerned that the spread of the Metaverse could lead to a significant increase in emissions. When the Metaverse relies on virtual reality (VR) technology and data centers, less movement reduces carbon dioxide emissions, but it has a negative impact on the environment. Data centers use artificial intelligence to recognize eye and hand movements, but virtual reality relies on cloud services. The operation of such a plant requires enormous energy and is very costly to the environment. In some point there is still lot of thing that need to be done and prepared to make sure this technology achieve its full potention and can be used and give benefit for business and every people with high concern of users safety.

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