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THE ROLE OF BIG DATA ANALYSIS IN FINANCIAL DECISION MAKING: THE CASE OF ISLAMIC BANKING

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Abstract

The use of big data from a Islamic economic perspective is certainly an important issue and cannot be postponed any longer, because the disparity in big data between the real sector and the financial sector, which has so far resulted in a lack of completeness in assessments, can be overcome by the limited data provided through big data. It is also possible that various matrices and cluster variants will emerge for various business sectors in an ecosystem. So it will make it easier to determine supply and demand in an ecosystem system. In this way, a closed loop economy based on a sharia ecosystem will be built automatically when big data is formed. This research uses an exploratory descriptive approach by analyzing the role of big data analysis in financial decision making: the case of Islamic banking. This scientific work was also developed using a literature review or library study approach. This research discusses the basic concepts of big data analysis consisting of the definition and characteristics of big data, financial decision making in sharia banking, and the potential application of big data analysis in Islamic banking.

Keywords: Big data, financial decision making, Islamic banking

INTRODUCTION

The development of data in the digital era has experienced enormous developments. The International Data Corporation estimates that more data is generated every two days in the world than has been generated since the beginning of time until 2003. The financial sector is one of the sectors that is experiencing development in the Big Data era. The conventional definition of Big Data includes the 3Vs (Volume, Velocity, and Variety), but this does not fully describe the opportunities and challenges that the Big Data revolution has generated in academic research and financial practice (Ahmed & Ameen, 2017).

Each day, financial institutions exchange millions of data. Big Data has emerged as a fascinating topic in the financial services industry for this reason. Trillions of data points are constantly used by the financial sector to make decisions. This circumstance has a significant impact on how the financial industry is changing, particularly in the areas of trading, investing, tax reform, risk analysis, automation, and fraud detection and investigation. The transmission of information is the primary factor that determines the effectiveness of financial markets. In this case, social media certainly has an important role in disseminating information. Social media generates millions of pieces of information every day on global financial markets. Predictions of stock returns and volatility, market valuation, excessive trading volumes, risk analysis, portfolio management, index performance, movements, option pricing, and trading algorithms are just a few of the ways that Big Data has an impact on financial markets. An example of research related to this is how market sentiment, which is measured by the number of times a particular stock is mentioned on certain content, will influence market efficiency. Machine learning techniques are also used in processing a series of Big Data. Big Data is also widely associated with corporate finance, where more data processing will reduce uncertainty, thereby reducing risk premiums and cost of capital; in the end it will make investment more attractive (Albaity & Rahman, 2019).

It is impossible to isolate the growth of Indonesia's Islamic banking industry from that of the country's overall Islamic banking system. In order to establish a balanced economic framework, Islamic banks' role in promoting regional economic growth is becoming more and more strategic. where it is clarified that the idea of profit sharing emphasizes the welfare of humanity more than the idea of interest, which is more focused on the individual without taking into account the effects on society. The Islamic banking system and conventional banking have similarities, however, in terms of remuneration provided to customers, they differ according to their respective remuneration principles.

Islamic banks as financial institution business actors that provide financing services are able to provide innovative offerings in products and services, bearing in mind that the customer's interest in carrying out transactions at an institution is absolutely in the hands of each consumer. The purchasing decision is a long process and has several stages such as problem recognition, information search, alternative evaluation, purchasing decision, and the final stage of behavior after purchasing. Factors that influence decision making are factors originating from the customer himself, which consists of cognitive processes which include needs or motivation, perceptions, attitudes and non-cognitive customer characteristics, namely demographic aspects, lifestyle and customer personality (Ahmed, 2016).

Ralph C. Davis asserts that decisions come from resolving issues that are confronted head-on. A decision is an unequivocal response to a query. Decisions need to be able to clarify issues regarding the topics being discussed with regard to planning. Making decisions involves methodically choosing the best option from a range of options to pursue in order to address issues. On the other hand, the methods or strategies employed in a decision-making process are known as decision making theory. The steps that must be taken in order to make a decision are known as the decision-making process. These steps serve as a fundamental framework within which numerous more sub-stages that are more operational or particular might be (Agustiningrum & Andjarwati, 2021).

For banks, it is very important to know customer behavior, which is a reflection of why a customer chooses a bank. By studying the behavior of a customer, we can further examine the considerations that underlie a person's process in selecting a bank. Consideration of consumer behavior is carried out taking into account rational and conscious economic considerations. Based on these considerations, banks must take advantage of opportunities and identify the desires of consumers or customers by looking at consumer behavior, including in this case the behavior of sharia bank customers.

RESEARCH METHOD

A method is an approach that can be utilized to accomplish a task. In the meantime, research methodologies can be understood as research when they are used to uncover phenomena that already exist or to gather data (Zulkarnaen, W., et al., 2020).

This study examines the use of big data analysis in financial decision-making using the example of Islamic banking and using a descriptive exploratory methodology. The development of this scientific work also involved a library study or book evaluation. Several sources are consulted while applying the theoretical/concept approach, including books, scholarly publications, and the internet. Every explanation of an existing concept is consolidated into a single framework. Writing this discussion uses information procedures regarding the discussion, in the form of previous research, then reviewing and analyzing various sources related to the discussion raised by the researcher.

RESULT AND DISCUSSION

Basic Concepts of Big Data Analysis

In the context of contemporary business and information technology, big data is a crucial idea. Big data is the term used to describe volumes of complicated, rapidly created data from a variety of sources that are enormous and varied in nature. Big data encompasses both organized and unstructured information, including text, photos, audio, and more. organized information is typically kept in standard databases (Bhimani & Willcocks, 2014).

In making decisions and making choices, a company must reflect on information from data owned by a company. Here, the function of big data is as a track record and written facts in a company's decision making.

A collection of extremely huge amounts of data is referred to as big data. Finding patterns or trends in this enormous amount of data can be done through management and analysis, particularly when it comes to customer interactions and behavior (Bourany, 2018).

Due to the size and complexity of the data sets that banks hold, traditional data processing systems are unable to generate high-quality data analysis. Because of its speed in tracking economic activity, this massive and intricate data gathering holds a great deal of knowledge and information that, when correctly managed via big data analytics, can provide very helpful information. Big data currently plays an important role for companies in various business sectors, because this large data collection can be used by businesses in various sectors to search for and manage information as reference material for building future business strategies. 95% of businesses also stated that they manage unstructured data owned by the company to solve various business problems (E Dumbill, 2012).

Big data can also be used for a variety of purposes to serve an organization's interests, including personalized customer service, risk analysis, fraud detection, and scientific research. With its ability to process and analyze data quickly and accurately, big data has become a very valuable tool in facing the challenges and opportunities in this digital era. The following is the role of big data which has great relevance in the world of business and technology today.

1. Decision Making

   First, big data helps organizations improve decision making based on better data. By collecting, managing, and analyzing data at scale, companies can make smarter, evidence-based decisions. This allows them to avoid making decisions based solely on assumptions and rely more on existing facts and figures.
2. Identifying Business Opportunities

   Second, big data allows organizations to identify business opportunities and potential problems. By analyzing market data and trends, companies can identify new growth opportunities or potential threats in the industry. With this information, they can take appropriate action to maximize opportunities and address problems before they become more serious.

3. Operational Efficiency
   Furthermore, big data also contributes to increasing operational efficiency. By monitoring and analyzing business processes, companies can identify areas where efficiency can be improved, resources can be saved, and time can be saved. This helps organizations optimize their operations and increase competitiveness.
4. Personalize Customer Satisfaction
   Additionally, big data can be used to improve customer understanding. By analyzing customer behavior and their preferences, companies can provide more personalized and relevant services. This not only strengthens relationships with customers but also helps in customer retention and business growth.
5. Create Product and Service Innovations
   Finally, big data supports product and service innovation. By understanding customer needs and market trends, organizations can develop new products and services that better meet market demands. This allows them to remain relevant and competitive in an ever-changing business environment (Gupta, 2016).

Thus, big data is not only a powerful tool for data analysis, but also the key to modern business success, helping organizations to take more precise and efficient steps in achieving their goals.

The characteristics of big data in the financial sector are as follows:

1. Large data size: Very large data sets can be absolute or relative. In other words, the size and quantity of big data, such market transaction data, is truly enormous.
2. High-dimensional: The term 'Big Data' implies more than just a large amount of data. This feature means that big data has many variables relative to the sample size. Machine learning is a common solution to dimensionality challenges, and is increasingly being used in finance research.
3. Complex structure: This feature means that data does not always have the traditional row and column format. Big data, which includes text, photos, videos, audio, and sound, has an incredibly intricate and sometimes unstructured structure. If this unstructured data can quantify economic activity that structured data cannot, then it adds value (Popovic et al, 2018).

Financial Decision Making in Islamic Banking

The principles of Islamic banking are regulations based on Islamic law between the bank and customers in storing funds and financing business activities. In its implementation, this principle prioritizes the values of honesty and fairness in transactions. One of the principles in Islamic economics is the prohibition of usury in its various forms, and refers to the system, among other things, the principle of profit sharing (Yusman Alim, 2017).

Islamic banks that implement a profit sharing system aim to create transactions that benefit various parties based on justice that is free from anything that is detrimental to customers. It is clear that the value of justice is reflected in the application of profit sharing, which is what differentiates it from conventional banking. Therefore, in running the Islamic banking industry, banks must apply sharia principles as the basis for their operations in all types of transactions which are used as a form of consistency in maintaining customer loyalty (Astuty & Umiyati, 2018).

In operationalizing Islamic banking, there are several basic principles in managing Islamic banking business activities. The basic principles in outline can be stated as follows:

1. Fairness, which is allocating profits based on actual sales in proportion to each party's commitment and risk.
2. Partnership, which denotes that financial institutions themselves, fund users, and investment customers (depositors) are on an equal footing as business partners who collaborate to generate profits.
3. Transparency: Islamic financial institutions shall furnish regular and transparent financial reports to their investor clients, enabling them to ascertain the state of their funds.
4. Universal: in line with Islamic precepts of rahmatan lil alamin, it does not distinguish between racial, religious, ethnic, or social class within (Ayyub, 2019).

Accepting deposits in the form of current accounts, savings accounts, and deposits is one of the goals of banking. Banks depend on these funds to run their operations; bank capital is not sufficient for them to do so. For this reason, banks are attempting to enhance the services they provide in order to draw in money from the general population. Apart from that, banks are one of the components that function in maintaining the balance of progress and unity of the national economy so that in carrying out their business they require the trust of the community, in this case customers. This is an attempt to keep the banking industry stable in light of the public's and customers' trust in it. This trust can be gained by providing legal certainty for bank oversight and regulation, as well as by banks guaranteeing customer deposits. Thus, by guaranteeing all bank obligations, bank owners, management, and the regulatory bodies tasked with overseeing bank supervision must be able to achieve public trust. The main principle of managing a financial institution, especially banking, is the principle of trust (fiduciary relationship). It is said to be the main principle because banking business activities are based on the trust of the community (Yusman Alim, 2017).

The precautionary principle is a juridical consequence as an institution that attracts funds from the public, so a financial institution or financing institution should be able to manage its business activities based on the precautionary principle. For this reason, financial institutions, especially banks, carry out feasibility studies before providing services to their customers (Muhammadiay et al, 2022).

Islamic financial institutions need to use the principle of full disclosure. This principle encourages institutions such as Islamic Banks to report optimally not only financial performance but also non-financial performance. To assess the financial performance of a company, measurements are needed. One way to study and measure a company's financial condition is by financial ratio analysis. The material for conducting ratio analysis is the financial reports that are periodically issued by the company. A balance sheet, profit and loss statement, or cash flow statement are examples of financial reports. Other information that needs to be conveyed in a sharia bank performance report is information related to non-financial performance. This information includes conformity with sharia principles, types of services (financing and collection), service standards to customers, as well as information about the field and quality of financing being carried out by sharia banks (Putri Dwi Cahyani, 2016).

Making decisions involves methodically choosing the best option from a range of options to pursue in order to address issues. On the other hand, the methods or strategies employed in a decision-making process are known as decision making theory. The steps that must be taken in order to make a decision are known as the decision-making process. According to Yogiarto Permana (2015), these phases serve as a fundamental foundation for the stages, which can then be further extended into a number of sub-stages that are more operational or particular.

Typically, the decision-making process involves three steps, which are as follows:

1. Identification of issues
   It is at this point that the problem needs to be precisely described in order to distinguish itself from a non-problem.
2. Solving issues
   Problems that are obvious or that already exist are fixed at this point. The processes are as follows:
   a. Determine different options for problem-solving;
   b. Compute variables that are unknown or outside the purview of humans, such as future events;
   c. Develop instruments for measuring or assessing outcomes, typically in the form of a results table;
   d. Choose and apply models for decision-making.
3. Making decisions: Decisions are made in response to external factors or current circumstances, including dangerous, uncertain, conflicting, and certain conditions.

In order to make the most profitable choice, customers evaluate and choose from a range of options based on specific interests. In this case, this process involves employing sharia banking (Carvalho et al, 2018).

In making decisions, customers need several influencing factors, including Islamic which is the main factor in making decisions using Islamic banking because sharia principles do not recognize the interest principles found in conventional banks. Another factor that influences customer decisions is product. Anything that can be made available to the market for ownership, usage, attention, or consumption in order to satiate needs and wants is considered a product. Islamic banking products are divided into three, namely fund distribution, fund collection and banking services. Products do not do well without promotion. Promotion is a communication from the bank to customers in the form of information. The information provided aims to better introduce customers to the products and services provided and to change customers' attitudes and behavior towards the bank (Yogiarto, 2015).

Service is the next consideration. Businesses that wish to grow and obtain a competitive edge must be able to offer goods and services of a high caliber at costs that are competitive (Ariani, 2007). The final factor that influences customers' decisions to use sharia banking is motivation. Maslow's theory suggests that motivation is based on human needs which are arranged from the most urgent to the least urgent. These needs consist of physical needs, a sense of security, socialization, appreciation and actualization (Fosso Wamba et al, 2015).

Potential Application of Big Data Analysis in Islamic Banking

The use of big data from a Islamic economic perspective is certainly an important issue and cannot be postponed any longer, because with the existence of big data, the disparity between the real sector and the financial sector which has been lacking in complete analysis can be overcome with the accuracy of the data that is informed through big data. It is also possible that various matrices and cluster variants will emerge for various business sectors in an ecosystem. So it will make it easier to determine supply and demand in an ecosystem system. In this way, a closed loop economy based on a sharia ecosystem will develop automatically when big data is formed (Mikalef et al, 2017).

It is important to note that one of the problems in developing Islamic economics in Indonesia is the lack of clear data about people who do not yet understand literacy about Islamic economics. Likewise, there is a way to measure the extent of community perception, participation and sense of ownership towards sharia economics so far (R Lidyah, 2018).

These indicators must be able to be known, but from various existing research it is felt that they are still insufficient to provide information that can be used in making Islamic economic development policies. The emergence of big data as a correlation of industry 4.0 can be used as a correction and at the same time an answer to various problems in the development of sharia economics so far. It's just a matter of how to start without having to reduce your sense of vigilance in maintaining the confidential security of the data (Popovic, 2018).

Then what becomes a special attraction for public policy makers when big data enters the sharia ecosystem is the detailed listing of data on muzakki and mustahik. Then data was recorded on the waqifs and the potential for moving and immovable waqf. Likewise regarding halal products and industries and even micro, small and medium enterprises (MSMEs) in an area. By consolidating this data in big data, it will make it easier for public policy actors to design development politics and sharia economic development budgets in a measurable manner and with high transparency accountability (M Nur Rianto, 2018).

The banking sector's ability to handle and process data to create valuable insights and improve business outcomes will define its future.

Decisions determined based on the results of data analysis can provide various benefits for the banking industry, such as:

1. Observe customer behavior and provide a better customer experience
   Businesses can use data to tailor financial experiences and communication methods to the individual interests and behaviors of each consumer. Companies can use data as a very helpful tool to enhance the quality of the customer experience. Data can also be tracked and further examined for company growth purposes.
2. Improve service quality in the future
   By using big data, data can be processed as a very useful source for improving the quality of banking services to customers. The use of big data analytics gives the banking industry the ability to create more measurable and faster innovations to improve service quality in the future.
3. Improve risk management
   Big data has the potential to improve risk management in the banking sector. Data can be the foundation for more precise risk assessment and performance measurement of banks. Big data analytics aids the banking sector in identifying potential fraud, expanding risk coverage, and having a more accurate prediction system, all of which enable it to assess risk fast (Oately, 2022)

CONCLUSION

Predictions of stock returns and volatility, market valuation, excessive trading volumes, risk analysis, portfolio management, index performance, movements, option pricing, and trading algorithms are just a few of the ways that Big Data has an impact on financial markets.

In order to establish a balanced economic framework, Islamic banks' role in promoting regional economic growth is becoming more and more strategic. Isalmic banks as financial institution business actors that provide financing services are able to provide innovative offerings in products and services, bearing in mind that the customer's interest in carrying out transactions at an institution is absolutely in the hands of each consumer. The choice to buy is a drawn-out process that involves a number of steps, including identifying the problem, gathering information, weighing your options, making the purchase, and acting on it thereafter. Factors that influence decision making are factors originating from the customer himself, which consists of cognitive processes which include needs or motivation, perceptions, attitudes and non-cognitive customer characteristics, namely demographic aspects, lifestyle and customer personality.

In operationalizing sharia banking, there are several basic principles in managing sharia banking business activities, namely: justice, partnership, transparency, universality.

REFERENCES

Agustiningrum, D., & Andjarwati, A. L. 2021. Pengaruh Kepercayaan, Kemudahan, dan Keamanan terhadap Keputusan Pembelian di Marketplace. Jurnal Ilmu Manajemen, 9(3), 896–906.

Ahmed, I., 2016, Aspiration of an Islamic Bank: A Exploration from Stakeholders Pespective, *International Journal of Islamic and Middle Eastern Finance dan Management*, Vol. 9, No.1, pp-.

Ahmed, W., & Ameen, K. 2017. Defining Big Data and Measuring Its Associated Trends in the Field of Information and Library Management. Library Hi Tech News, 9, 21–24.

Albaity, M., & Rahman, M. 2019. The Intention to Use Islamic Banking: an Exploratory Study to Measure Islamic Financial Literacy. International Journal of Emerging Markets, 14, 988–1012.

Atanasius Hardian Permana Yogiarto, A. 2015. Pengaruh Bagi Hasil, Promosi, dan Kualitas Pelayanan terhadap Keputusan Penggunaan Jasa Perbankan Syariah Tabungan Mudharabah (Studi Kasus pada Nasabah Bank Muamalat Pekalongan) (Doctoral dissertation, Fakultas Ekonomi).

Astuty, P., & Umiyati, U. 2018. Inluence Of Religiosity Towards The Saving Interest At Islamic Banking With The Knowledge Of The People As Moderator Variable (Case Study On The People Of South Tanggerang City). Ikonomika, 3(1), 1–16.

Ayyub, S., Xuhui, W., Asif, M., & Ayyub, R. M. 2019. Determinants of Intention to Use Islamic Banking: A Comparative Analysis of Users and Non-Users of Islamic banking: Evidence from Pakistan. *International Journal of Islamic and Middle Eastern Finance and Management*, 13, 147– 163.

Bhimani, A., & Willcocks, L.. 2014. Digitisation, Big Data, and the Transformation of Accounting Information. Accounting and Business Research, 44(4) (2014), 469–490.

Bourany, T., 2018. Les 5V du big data. Regards croises sur l'economie, (2), pp.27-31.

Cahyani, Putri Dwi. 2016. Tingkat Kepuasan Nasabah Terhadap Kualitas Layanan Perbankan Syariah Di Yogyakarta. *Jurnal Bisnis dan Manajemen*. 6(2).

Carvalho, N., Chaim, O., Cazarini, E., & Gerolamo, M. 2018. Manufacturing in The Fourth Industrial Revolution: A Positive Prospect in Sustainable Manufacturing. Procedia Manufacturing, Vol. 21, pp 671-678.

Djasmin Maku, Yusman Alim. 2017. Penerapan Prinsip-Prinsip Tentang Perbankan Syariah Hubungannya dengan Otoritas Jasa Keuangan. Lex Crimen 6, no. 1

Dumbill, E. 2012. *Big Data Now Current Perspective*. O"Reilly media.

Fosso Wamba, S., Akter, S., Edwards, A., Chopin, G., & Gnanzou, D. 2015. How "Big data" can make Big impact: Findings from a systematic review and a longitudinal case study. International Journal of Production Economics, 165, 234–246.

Gupta, U.G. and Gupta, A., 2016. Vision: a missing key dimension in the 5V Big Data framework. Journal of International Business Research and Marketing, 1(3), pp.50-56.

Lidyah, R. 2018. Islamic Corporate Governance, Islamicity Financial Perforance Index and Fraudat Islamic Bank. Jurnal Akuntansi, 22(3), 437–453.

M. Nur Rianto Al Arif. 2015. *Pengantar Ekonomi Syariah: Teori dan Praktik* (I). CV Pustaka Setia.

Masni H. 2019. Analisis Penerapan Shariah Compliance dalam Produk Bank Syariah. *Jurnal Hukum Ekonomi Syariah*, *3*(2), 118–137.

Mikalef, P., Framnes, V. A., Danielsen, F., & Krogstie, J. 2017. Big Data Analytics Capability: Antecedents and Business Value. AIS Electronic Library (AISeL).

Muhammadiah, Muhammadiah, and Zulhamdi Zulhamdi. 2022. Implementasi

Murabahah Pada Perbankan Syariah. *Al-Hiwalah: Journal Syariah Economic Law* 1, no. 1, 53–74.

Oatley, G.C., 2022. Themes in data mining, big data, and crime analytics. Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery, 12(2), p.e1432.

Popovič, A., Hackney, R., Tassabehji, R., & Castelli, M. 2018. The impact of big data analytics on firms' high value business performance. Information Systems Frontiers, 20(2), 209–222.

Yusman Alim. 2017. Penerapan Prinsip-Prinsip tentang Perbankan Syariah Hubungannya dengan Otoritas Jasa Keuangan. *Lex Crimen*, *VI*(1), 39–45.

Zulkarnaen, W., Fitriani, I., & Yuningsih, N. 2020. Pengembangan Supply ChainManagement Dalam Pengelolaan Distribusi Logistik Pemilu Yang Lebih Tepat Jenis, Tepat Jumlah Dan Tepat Waktu Berbasis Human Resources CompetencyDevelopment Di KPU Jawa Barat. *Jurnal Ilmiah MEA (Manajemen, Ekonomi, &Akuntansi)*, 4(2), 222-243.