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Predictive Analysis in Islamic Accounting: Understanding Financial Trends Through Advanced Technology

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ABSTRACK

This research aims to map studies related to technology applied in Islamic accounting using the bibliometric method of VOSviewer and a literature review to examine and analyze the application of advanced technology in understanding and predicting financial trends in the Islamic accounting sector. This study employs a mixed-method research approach, utilizing quantitative methods for the bibliometric study and qualitative methods for the literature review. The results indicate that, based on data collected from 2010 to 2024, there are 601 Scopus journals related to Islamic accounting technology. The visualization results from the VOSviewer software regarding the research map related to big data, blockchain, artificial intelligence, and sharia accounting show the presence of 8 clusters with 141 topic items. This research demonstrates that the development of AI, blockchain, and big data in the Islamic accounting sector plays a significant role. The implications of this study suggest that advanced technology can enhance operational efficiency, identify risks, understand customer preferences in accordance with Islamic values, and emphasize the importance of developing employee skills in the Islamic accounting sector to operate technologies such as AI, blockchain, and big data.

Introduction

The development of technology in the world, ranging from simple technology to modern technology, indirectly compels society and companies to utilize and engage with these technologies. In the current era of digital transformation, the technology that is widely discussed is modern technology, commonly referred to as advanced technology. According to Febrianti, Wahdiat, & Juwenah (2021), Advanced technology is an essential tool used to assist companies in generating more accurate, fast, and timely information for decision-making, as well as providing assurance that technology can facilitate the tasks being performed. The revolution of advanced technology has a significant impact on all aspects, including the Islamic accounting industry. Currently, advanced technology can simplify and enhance the proficiency of Islamic accounting tasks, such as bookkeeping (Mulyana Fitri, Sirait, and Nurlaila 2023). In addition, this technology has provided powerful data analysis capabilities in accounting. With the presence of advanced data analysis tools and techniques, companies can extract important information from their financial data (Bujangga 2023).

The rapid growth of advanced technology has been accompanied by significant developments in information technology, telecommunications, blockchain, big data, artificial intelligence (AI), data analytics, and various other technological innovations. The speed of this change creates substantial opportunities to enhance efficiency and expand access to Islamic financial services (Sudarmanto et al. 2024). In addition to providing significant opportunities, advanced technology also presents its own challenges for Islamic accounting. However, it is essential to understand how to effectively integrate technology without compromising Sharia compliance, so that these challenges can be minimized.

Advanced technology is increasingly being utilized in accounting software to automate repetitive tasks, analyze large volumes of data, and provide insights for decision-making. This can help accountants focus on more strategic and value-added tasks (Nugrahanti, Puspitasari, and Andaningsih 2023). The use of advanced technology in the field of accounting presents both opportunities and challenges. This is evident in Islamic accounting, where technologies such as blockchain, big data, artificial intelligence (AI), and others facilitate the execution of various activities. However, it is important to analyze whether these technologies will provide opportunities or challenges in the future.

Research on blockchain, AI, and big data has been conducted previously, including studies that Fauziyah (2022) which states that the benefits of applying financial technology in the field of accounting include that blockchain can simplify the process of more complex transactions, while artificial intelligence (AI) helps accountants provide important business advice to become better

consultants. Additionally, the implementation of big data impacts accounting, for example, in how financial reports are prepared and audited. Research conducted by Krisdianto (2024) states that the strategy for implementing financial technologies such as blockchain, artificial intelligence (AI), and big data is a key factor in achieving high-quality financial performance in the digital era, with professional accountants playing a strategic role as pioneers of change and adaptation.

The researcher is interested in conducting this study to fill the knowledge gap in the literature regarding the application of advanced technology in financial trends, particularly in the Islamic accounting sector. Additionally, this research aims to explore the extent to which advanced technology transforms organizational management and financial data analysis in the Islamic accounting sector. This is done to identify new opportunities while addressing potential challenges that may arise from the use of advanced technology. The analysis conducted can predict which financial trends will be utilized in the future.

This study aims to map research related to technology applied in Islamic accounting using the bibliometric method of VOSviewer and a literature review to examine and analyze the application of advanced technologies such as AI, blockchain, and big data in understanding and predicting financial trends in the Islamic accounting sector. It is hoped that this research will provide a deeper understanding of the potential of advanced technology in the Islamic accounting sector in the future. The results of this study are expected to encourage the development and application of advanced technology in Islamic accounting operations, which can enhance effectiveness, efficiency, competitiveness, transparency, and align with Islamic principles.

Literature Review

Diffusion of Innovation Theory

In the research by Suryafma et al. (2023), which cites Rogers' (2003) book titled *Diffusion of Innovation*, the theory of diffusion of innovation explains how an innovation is accepted and disseminated through specific communication channels within a social group over a certain period. This theory states that the speed at which an innovation is adopted depends on four main factors: the characteristics of the innovation, the communication channels used to convey the benefits of the innovation, the timing of the innovation's introduction, and the social system in which the innovation spreads. The more complex and significant the innovation, the longer the time required for its diffusion process. There are five characteristics of innovation that influence adoption: relative advantage, compatibility, complexity, trialability, and observability.

Predictive Analytics

In the current digital era, predictive analytics has become one of the most valuable keys due to its ability to leverage historical data and advanced algorithms to forecast future events. The advantages offered by the implementation of predictive analytics include the insights provided to organizations, enabling them to make and execute strategic and more accurate decisions.

Predictive analytics is defined as the process of using a set of advanced analytical tools to develop models and forecast what is likely to happen in the future. Predictive analytics can help connect data to effective actions by drawing reliable conclusions about the current situation and future events(Nani 2016). Predictive analytics provides a level of opportunity for the occurrence of an event based on the information gathered, explaining the relationships between various data variables, and enriching information. This enables the prediction of behavioral patterns over a specific period (past, present, or future), which relies heavily on the quality of the analysis and the assumptions used.

Forecasting and predictive analytics are related to predicting events that have not yet occurred. However, forecasting is more focused on predicting what will happen in the future, while predictive analytics aims to predict trends and behaviors in the future. Predictive analytics differs from forecasting in that it assigns predictive scores to each element of the analysis. The probability values from this analysis can be integrated into predictive analytics in the decision-making process, helping to prevent potential issues and reducing the likelihood of failure to nearly zero (Nainggolan 2017).

Data security is a critical aspect that cannot be overlooked in the practice of predictive analytics. As organizations collect and analyze data to gain valuable insights, they also face challenges related to privacy, integrity, and information security. In the context of predictive analytics, where algorithms may require access to sensitive data to produce accurate results, data protection becomes a top priority.

Efforts to safeguard data involve implementing encryption technologies, enforcing strict access controls, and training employees on information security practices. Additionally, regulations such as the GDPR in Europe tighten requirements related to the protection of personal data, emphasizing the importance of an organization's commitment to adhering to stringent security standards. By ensuring effective data security, organizations not only protect themselves from potential breaches and financial losses but also build trust with their stakeholders and customers(Agastya 2023).

Islamic Accounting

The majority of Indonesia's population is Muslim, which means that Islamic values and principles play a significant role in the social and economic life of the community. This is one of the reasons behind the emergence of the Sharia system. Additionally, the public's awareness of the injustices associated with conventional banking schemes has also supported the development of the Sharia system. As a result, people began to seek alternatives that align with their social and religious principles, making the Sharia system a suitable and attractive choice.

In Indonesia, Islamic financial institutions consist of two types: banks and non-banks. Some examples of non-bank institutions include insurance companies, pawnshops, mutual funds, capital markets, Islamic Rural Banks (BPRS), and Islamic Microfinance Institutions (BMT). On the other hand, there are several Islamic banking institutions, such as Bank Syariah Indonesia, BCA Syariah, and others. Essentially, each financial institution has its own unique methods and processes that distinguish it from others in the market competition(Yuni, Insani, and Nurlaila 2023).

Islamic finance is increasingly integrating conventional finance principles while adhering to Islamic law, driven by a demand for ethical and sustainable investment options. This trend reflects a growing recognition of the need for financial products that align with both Sharia principles and modern financial practices, enhancing their appeal to a broader audience (Amrullah and Hasan 2021). Based on the opinion of (Ilyas 2020), In essence, when viewed conceptually, the practice of Islamic accounting serves as a solution to several issues associated with conventional accounting transactions that do not align with Islamic principles. The principles emphasized in Islamic finance focus on ethical and moral aspects. Prohibitions against riba (usury), the promotion of social justice, the prohibition of excessive speculation, and adherence to Islamic ethical principles are some of the key tenets of Sharia regarding finance (Norrahman 2023).

Islamic accounting is related to the activities of recognizing, measuring, recording, and disclosing transactions as well as rights and obligations in a fair manner. The concept of accounting in Islam emphasizes accountability, based on the teachings of the Quran, particularly in Surah Al-Baqarah, verse 282. This verse underscores the obligation for a believer to document every unfinished transaction to ensure clarity regarding its condition, the timing of the transaction, and to make it easily observable by others, thereby preventing any doubts or disputes (Sitorus and Siregar 2022).

Advanced Technology

The development of technology in the current era is rapidly advancing, particularly in the fields of information and communication technology related

to computing. The application of information technology within companies is closely linked to computer users to support various tasks, including those in the accounting sector.

Currently, companies are transitioning from manual systems to computerized accounting information systems. All types of companies, whether they operate in services, commerce, manufacturing, or are government-owned enterprises (BUMN) and private companies, require accounting information systems to carry out their business activities. This is because technology has a significant impact on the performance of the company (Febrianti et al. 2021).

The sophistication of technology can be described as the advancement of the technological world across various aspects. The technology in question focuses on computer-based techniques in managing accounting information systems. Companies that implement computer-based information technology, supported by other auxiliary applications, can experience positive impacts on their operational performance.

This can be monitored or recognized through software and hardware; as these two components become more advanced, they are better able to support the effectiveness of accounting information systems. Accounting information systems, of course, must consider the needs and maintenance of the technology being used to ensure optimal performance and reliability(Bagus et al. 2022).

Initially, the rapid advancement of technology raised concerns among accountants and aspiring accountants, particularly those who were not prepared to face the new challenges posed by technological progress. One area of concern was the fear that technological advancements could fundamentally change the role of accountants in every accounting process.

The challenges that arise in the technological era are unavoidable, and accountants must adapt effectively to develop strategies to address them. Over time, information technology has actually been able to foster a positive relationship with accounting professionals, enhancing their capabilities and allowing them to focus on more strategic tasks rather than routine processes. This evolution has led to a more integrated approach where technology and accounting work hand in hand to improve efficiency and accuracy in financial reporting and analysis(Fauzi et al. 2022).

In an increasingly digitalized era, organizations and the accounting profession are facing significant changes in how they collect, analyze, and report financial information. Advanced technologies such as artificial intelligence (AI), big data, and blockchain technology have opened the door to innovative opportunities and unavoidable challenges in the accounting world.

As a fundamental tool for managing financial information, digital technology plays a crucial role in transforming accounting processes, driving a significant shift from faster and more accurate data processing to more detailed

predictive analytics. Digital technology enables accounting professionals to enhance efficiency, reliability, and the quality of decision-making, which is becoming increasingly complex. This transformation not only streamlines traditional accounting tasks but also empowers accountants to provide deeper insights and strategic guidance to their organizations(Salsabila and Rahman 2023).

Research Methodology

This research uses a research method with a mix-method approach, namely quantitative methods in bibliometric studies and qualitative methods in literature review studies. According to Fadli (2021), Qualitative research is a type of research that investigates relationships, activities, situations, or various materials. This research uses Structured Literature Review (SLR) by conducting a review of several articles and journals that have been published on relevant topics and concepts. The articles and journals will then be analysed systematically (Nani 2016).

The data sources were obtained from a search of Scopus journals and the Publish or Perish 8 software. The data analysis tools used included Microsoft Excel and VOSviewer. The data collection techniques involved: (1) opening the Publish or Perish 8 software and searching for journals based on the title keywords "Big Data, Blockchain, Artificial Intelligence, and Sharia Accounting" within the period of 2010-2024; (2) collecting the journal titles in Microsoft Excel and identifying any duplicate titles; (3) downloading files in RIS (Research Information Systems) and PDF (Portable Document Format) formats from all the collected journals; and (4) importing the RIS data files into Mendeley Desktop software.

The data analysis techniques included: (1) mapping the distribution of journal publications related to Big Data, Blockchain, Artificial Intelligence, and Sharia Accounting using Microsoft Excel based on the year of publication; (2) visualizing the bibliometric network and publication trends related to Big Data, Blockchain, Artificial Intelligence, and Sharia Accounting using the VOSviewer (Visualization of Similarities) software based on the number of clusters and items; and (3) mapping the research topics related to Big Data, Blockchain, Artificial Intelligence, and Sharia Accounting through a literature review (Budianto 2023).

During the research process, the author analyzed and shared findings from various sources to identify patterns, trends, and relevant implications in the context of predictive analytics in Islamic accounting with financial trends through advanced technology. This study also examined the challenges and opportunities associated with the use of technology in accounting, as well as the mitigations that can be implemented to address these challenges. The results of

this narrative review were then organized into paragraphs that form a coherent and comprehensive narrative. Conclusions and implications of the findings were also presented to provide a deeper understanding of predictive analytics in Islamic accounting with financial trends through advanced technology.

Results And Discussion

Journal Publication Distribution Mapping and VOSviewer Bibliometric Study related to big data, blockchain, artificial intelligence, and sharia accounting

There are 601 Scopus journals based on the results of data collection during the period 2010 to 2024. The details are as follows:

Table 1.

Journal Publication Data on Islamic Accounting Technology by Year 2010-2024

Year	Number of Publications	Year	Number of Publications	Year	Number of Publications
2010	24	2015	16	2020	78
2011	25	2016	27	2021	74
2012	21	2017	29	2022	70
2013	26	2018	56	2023	53
2014	14	2019	68	2024	20

Source: Data processed, Microsoft Excel 2010

While the results of the bibliometric study using VOSviewer software, the visualisation is as follows:

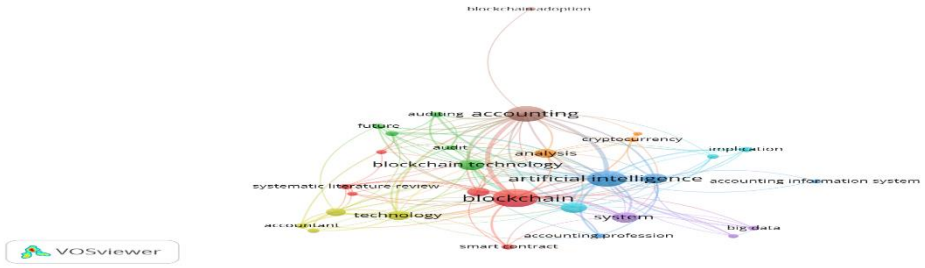

Figure 1.

Network visualisation of research development map around Islamic accounting technology.

Source: Data processed, VOSViewer 1.6.20 Software.

The visualization results from the VOSViewer software regarding the research map related to big data, blockchain, artificial intelligence, and sharia accounting show the presence of 8 clusters with 141 topic items mapped, as follows:

First, Cluster 1 consists of 23 topic items, namely: blockchain, accounting, artificial intelligence, technology, accountant, accounting profession, big data, system, analysis, audit, future research, future, implication, cryptocurrency, and smart contract.

Second, Cluster 2 consists of 12 topic items, which are: blockchain technology, accounting, auditing, literature review, analysis, artificial intelligence, management, application, accounting profession, and internet.

Third, Cluster 3 consists of 20 topic items, including: artificial intelligence, accounting information system, blockchain technology, analysis, audit, literature review, auditing, accounting, implication, blockchain, business, technology, big data, and accounting profession.

Fourth, Cluster 4 consists of 15 topic items, which are: technology, accountant, smart contract, accounting profession, blockchain, artificial intelligence, analysis, audit, and accounting.

Fifth, Cluster 5 consists of 14 topic items, namely: system, big data, smart contract, technology, blockchain, artificial intelligence, blockchain technology, analysis, cryptocurrency, and accounting.

Sixth, Cluster 6 consists of 14 topic items, which are: application, cloud, smart contract, technology, internet, artificial intelligence, blockchain technology, analysis, implication, and accounting.

Seventh, Cluster 7 consists of 13 topic items, including: analysis, accounting, bitcoin, case study, audit, future research, blockchain technology, artificial intelligence, blockchain, and technology.

Eighth, Cluster 8 consists of 23 topic items, which are: accounting, blockchain adoption, auditing, future, cryptocurrency, implication, analysis, audit, future research, blockchain technology, artificial intelligence, blockchain, big data, technology, and accountant.

Literature Review Mapping around Big Data in Understanding Financial Trend through Advanced Technology

In today's digital era, the internet is the primary technology used to assist human activities in daily life. Due to the significant influence of the internet on human life, the utilization of digital resources through the internet in the workplace has also been affected. One aspect that will be discussed is the impact of using digital internet technologies, such as big data, within a company. Big data refers to large and complex datasets that cannot be processed using traditional data processing methods. Big data has four main characteristics: volume (the sheer amount of data), velocity (the speed at which data is generated and processed), variety (the types and formats of data), and veracity (the quality and accuracy of the data) (Venger and Akhtoian 2021).

In the field of accounting, the application of big data has an influence on the performance of the accounting profession. As research conducted by Peterson dan Kurniawan (2023) Big data has the potential to enhance effectiveness within companies, assist in determining the likelihood of positive or negative outcomes, help assess why certain events may occur, and aid in identifying the best options for responding to upcoming events. With the presence of big data technology in companies, reports that were previously susceptible to manipulation by accountants and errors in data entry should now be minimized, thanks to the capabilities of big data technology that can assist auditors in preventing fraud.

Saragih dan Dewayanto (2023) It is stated that big data analytics (BDA) technology provides benefits for improving audit quality. BDA assists auditors in managing large volumes of data, integrating various available information, and making decisions regarding audit sampling. Big data analytics technology helps auditors perform audit procedures by effectively automating tasks that were previously carried out by humans. The impact of big data analytics technology on the audit field includes aiding in the analysis of business processes and internal controls, planning audits, assessing risks, collecting audit evidence, identifying audit samples, analyzing data, and drawing conclusions and audit opinions.

In addition, research by Dharma dan Hendri (2022) by conducting a SWOT analysis which includes strengths, weaknesses, opportunities and challenges or threats to the utilisation of big data analytics in auditing in the public sector. From the results of the analysis, the strengths include strong external driving factors, namely strong support from stakeholders and high public demand for accountability and transparency of audit results. Meanwhile, the weaknesses are the expensive investment costs for BDA hardware and software and the absence of audit standards governing the use of BDA in audits. Then the opportunity is to make it easier for auditors to analyse because the use of BDA technology can improve the quality of audit results and the application

of sustainable audits can be carried out in real time. For threats, namely misuse of data that escapes supervision and human resources who have the expertise and skills to manage big data analytics are needed.

Mapping Literature Review Studies around Blockchain in Understanding Financial Trends Through Advanced Technology

In the ever-evolving digital era, blockchain technology has become a hot topic across various sectors, including the financial industry. Blockchain is a technology used to record transactions in a secure, decentralized, and transparent manner. Information about these transactions is stored in interconnected blocks that cannot be easily altered (Pratiwi Lady Liesdyana 2021). Blockchain technology has now been applied in the field of accounting, particularly in Islamic accounting. The characteristics of Islamic accounting, such as the management of zakat funds, the prohibition of riba (interest), and the use of Sharia-compliant financial instruments, make the application of blockchain technology an interesting option for strengthening important aspects of Islamic accounting. This suggests that blockchain technology could assist in the transaction processes within Islamic accounting.

Blockchain technology has its advantages and disadvantages in facilitating Sharia financial transactions. As indicated by research conducted by Ahmad Fuadi Tanjung, Patma Wati (2023) Blockchain technology can enhance efficiency, transparency, security, accountability, and cost reduction in the Islamic finance industry. However, this technology also has several shortcomings and challenges that need to be addressed, such as scalability limitations, vulnerability to attacks, dependence on digital technology infrastructure, difficulties in regulation and compliance, and a lack of understanding and readiness within various industries. By overcoming these challenges and optimizing the benefits of blockchain, this technology can make a positive contribution to the development of the Islamic finance industry, improving efficiency, transparency, and security in Sharia financial transactions, as well as strengthening the trust relationship between companies and investors. The research suggests that in the future, blockchain technology could provide interesting contributions to financial transaction processes by maximizing the optimization of the benefits of blockchain technology.

Research Javaid, Haleem, Singh, Suman, & Khan (2022), It is stated that in the future, blockchain will play a significant role in managing various activities in the financial sector. This statement is supported by data indicating that factories around the world are beginning to adopt blockchain technology. Future factories will consist of a network of equipment, accessories, goods, and a wide range of value chain partners, such as equipment suppliers and logistics companies. However, there are challenges in the implementation of blockchain

technology. Despite these difficulties, hundreds of financial institutions continue to utilize this technology. Furthermore, research Arwin, Aulia, & Uzliawati (2023), Blockchain technology enhances supply chain management by providing transparency, traceability, and efficiency in tracking products and transactions. For the accounting industry, it offers improved accuracy, security, and reduced fraud risk, ultimately streamlining financial processes and audits.

Literature Review Mapping around Artificial Intelligence in Understanding Financial Trend through Advanced Technology

Currently, life has entered an era that is entirely digital. It is an era where all activities are conducted using advanced technology. Digitalization has emerged to replace past technologies with more modern and practical solutions. In recent years, AI (Artificial Intelligence) has become one of the increasingly important topics that attract a lot of attention. Especially with the rapid development of digital technology, AI has become one of the technologies used in the accounting field. AI has the potential to transform traditional accounting practices, both by enhancing efficiency and providing deeper insights into decision-making processes. By employing intelligent systems, detection becomes faster, thereby reducing the risk of fraud and allowing for earlier prevention.

As indicated by research conducted by Ilma Amelia et al., (2024) One of the main areas where AI can be applied in accounting is in the data processing workflow. AI's ability to quickly process and analyze large volumes of data makes accounting more efficient and accurate. The use of AI can also be employed in automating routine tasks such as data entry, transaction classification, and financial report preparation. This can reduce human errors, save time, and conserve resources.

The implementation of AI in accounting can also enhance security and fraud detection. AI can be used to monitor financial transactions in real-time and detect suspicious or unusual patterns.In the context of accuracy, companies that adopt AI technology experience significant improvements. For example, based on research conducted by Chukwudi et al., (2018) The research conducted in a company in Southern Nigeria revealed that the company experienced a reduction of over 50% in human errors in transaction recording, due to many large companies deciding to integrate AI technology into their accounting systems. Additionally, similar research has also been conducted by other companies in the financial sector Luan et al., (2020) which reveals that one company uses AI technology to automate routine tasks such as daily transaction recording and financial report preparation. This reduces the time required for these tasks, allowing accounting staff to focus on more in-depth analysis. The investigated company experienced increased efficiency in its accounting system after implementing AI technology. However, significant differences emerged in the

efficiency achieved. Some companies experienced an increase in the time for routine tasks by up to 30%, while others reached 20%. This indicates variability that can be influenced by the size of the company, operational complexity, and the different levels of technology adaptation.

Overall, the utilization of AI in accounting can provide numerous benefits, ranging from operational efficiency to better decision-making. However, the use of AI in accounting also presents challenges and considerations that must be taken into account, such as the need for high-quality and well-structured data (Ilma Amelia et al. 2024). AI itself requires accurate data and relevant supporting data to provide optimal results. Another aspect to consider in the use of AI in accounting is data security, especially financial data. Financial data is a valuable asset that needs to be carefully protected. The use of AI in accounting also needs to consider ethics and privacy, particularly in terms of customer data processing (Fathir Maulid Yusuf et al. 2023).

Cunclossion

Based on the discussion above, the following conclusions can be drawn. First, based on the mapping of the number of publications related to Islamic accounting technology from 2010 to 2024 sourced from Scopus, there are 601 research articles. Second, based on VOSviewer mapping, the visualization results of the network related to accounting technology are divided into 8 clusters and 141 topic items. Cluster 1 consists of 15 topics, cluster 2 consists of 10 topics, cluster 3 consists of 14 topics, cluster 4 consists of 9 topics, cluster 5 consists of 10 topics, cluster 6 consists of 10 topics, cluster 7 consists of 10 topics, and cluster 8 consists of 15 topics. Third, the research indicates that the utilization of AI in accounting provides benefits, including increasing operational efficiency by 20%-30% and supporting better decision-making, although there are still several challenges that need to be managed. Additionally, blockchain technology is expected to play an important role in the financial sector, including Islamic accounting, by enhancing efficiency, transparency, security, and accountability. However, the implementation of blockchain faces obstacles such as scalability, cyberattacks, and a lack of regulation and industry readiness. The implementation of big data also has significant impacts, such as improving audit quality, business analysis, and internal control, but is hindered by high investment costs, a lack of audit standards, data misuse risks, and the need for big data analytics experts.

Research Implication

Based on the research findings, the theoretical implications include the use of advanced technology that enables companies to better identify and assess potential risks, improve operational efficiency through the automation of accounting processes, and help the Islamic finance sector understand customer preferences to develop products that align with Sharia values. Practically, this research emphasizes the importance of employees, particularly in the Islamic accounting sector, to continuously update their skills in the use of advanced technologies such as AI, Blockchain, and Big Data. Employees who do not develop their skills risk losing their jobs as companies prefer a workforce that is skilled in operating these technologies.

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