The Role of Artificial Intelligence Dimensions on Accounting Information System Efficiency: Case Study of a Sharia Banking Company in Indonesia

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Abstract: This study examines the role of artificial intelligence dimension in improving the efficiency of Accounting Information Systems in Islamic Banking Companies in Indonesia. In the era of the growing industrial revolution 4.0, the role of artificial intelligence is becoming the center of attention in various sectors and businesses. The development of artificial intelligence technology has had a significant impact on the way financial information is processed, managed, and used in decision making. This study aims to analyze in depth the application of artificial intelligence dimensions in the realm of accounting and identify the relationship to the efficiency of Accounting Information Systems. The results of this study are expected to provide important knowledge about the role of artificial intelligence technology in the context of accounting, as well as provide guidance for accounting and technology practitioners to optimize the use of artificial intelligence in improving the efficiency of Accounting Information Systems. By examining 34 respondents from 19 Islamic Banking Companies in Indonesia, the study found that the dimension of machine learning has a positive effect on the efficiency of accounting information system. However, this study did not find a positive effect of expert system dimension and knowledge representation and inference dimension on accounting information system efficiency.

Keyword: Artificial intelligence, Efficiency Accounting Information System, Sharia Banking.

INTRODUCTION

During the growing digital era of the Industrial Revolution 4.0, the role of artificial intelligence has become a major highlight in various business and industrial sectors. Quoted from the Kompas newspaper that there are three sectors of the business field that are exposed to the highest artificial intelligence, including the information and communication sector (58 percent), the financial and insurance services sector (55.2 percent), and the corporate services sector (52.3 percent). Over the three sectors of the business field one aspect that has

undergone drastic changes is the Accounting Information System, which is the core of financial information management within the organization. The development of artificial intelligence technology has had a significant impact on how financial information is processed, managed, and used in decision-making.

Artificial intelligence is the idea of cutting-edge advanced technology based on databases. The system first appeared in 1955, created by Herbert Simon, Allen New ell, and Jhon Shaw, and was designed to "imitating human problem-solving abilities" (logic theory). According to Haenlin and Kaplan (2019, cited in Zemankova, 2019) that artificial intelligence as the ability of a system to accurately perceive external data, learn from it, and apply what has been learned to meet specific goals and tasks through flexible adaptation. Zhang et al (2020) define artificial intelligence a little differently, it is said that artificial intelligence is the result of the successful use of big data technology and machine learning to understand the past and predict the future using large amounts of data. Artificial intelligence allows machines to learn from their mistakes, adapt to new inputs, and carry out work like humans (Lee & Tajudeen, 2020).

The combination of artificial intelligence and accounting is not limited to the application of financial robots, but also reflects the development of accounting theory against the background of changing times. One of them is the "New Management Accounting Theory", where this theory believes that in the era of artificial intelligence financial personnel still have room both to survive and thrive (Li, Haohao, & Ming, 2019). In the context of artificial intelligence, the accountant function has been transformed from the original financial accounting by using financial data to provide information to support business units.

The study conducted by Haddad (2021), outlines artificial intelligence into three different dimensions, namely expert systems, knowledge representation and inference, and machine learning. A number of studies have attempted to explore the implications of artificial intelligence technology on accounting, as well as the impact on the accounting profession. In his research, Hamadneh et al (2021) put forward a hypothesis that predicts automation in the accounting world can gradually lead to a shift in the roles of accountants and auditors, because this automation allows individuals without sufficient field experience to carry out these tasks, ultimately reducing the role of humans in the accounting profession. However, this view is different from the results of the study of Al-Sayyed et al (2021) who saw artificial intelligence technology in accounting as an opportunity, not as a threat. As well as, the benefits of artificial intelligence in organizations, and more specifically, its ability to improve performance both at the organizational (financial, marketing and administrative) and process levels (Taguimdje, W. et al, 2020). Hashem, F., et al (2021), and Haddad, H (2021) also conducted a study related to the effect of artificial intelligence on the efficiency of accounting information systems conducted at Jordanian Manufacturing and Banking Companies.

Accounting Information System (AIS) can be described as a series of interconnected components, including tools, procedures, devices, and software, which interact together in order to analyze financial data, control, and supply when needed (Sari et al, 2019). AIS processes the data and delivers this valuable information to the users. An efficient AIS helps in perfecting business transactions and enables effective decision-making by users by providing substantial information at accurate time. AIS efficiency also helps in sharing knowledge and proficiency, thereby improving operations (Romney and Steinbart, 2013; Teru et al, 2016; Li et al, 2019).

Results of the study Haddad, H., (2021) found that the three dimensions of artificial intelligence, have a positive impact on the dimension of excellence of accounting information systems measured through the dimension of efficiency of accounting information systems. A similar study was also conducted by Hasem, F., et al (2021), showed that artificial

intelligence has a positive effect on improving the efficiency of Accounting Information Systems. The latest study of Qasaimeh et al (2022) also found that the use of artificial intelligence with neural networks increases the efficiency of AIS and provides a basis for accounting information for management.

This research is the development of studies conducted by Haddad, H., (2021) to examine separately the three dimensions of artificial intelligence on the efficiency of Accounting Information Systems. The use of "New Management Accounting Theory" research model Development Foundation. The difference of this study with the previous study is the joint testing of the dimensions of artificial intelligence (expert systems, knowledge representation and inference, machine learning) to the advantages of AIS tested through the efficiency dimension of accounting information systems.

During the covid-19 period, the growth of Sharia Banking in Indonesia was very stretched. Based on data issued by PT Bank Syariah Indonesia Tbk (BSI) that in September 2021 the financing of the National Islamic banking grew by 12,24 percent, and in terms of funding in the form of third-party funds (DPK) showed growth of 9,42 percent (https://www.republika.co.id/). By exploring how the effect of artificial intelligence on the performance of Islamic Banking Companies in Indonesia through the efficiency of Accounting Information Systems aims to analyze the relationship of various dimensions of artificial intelligence, and the efficiency of Accounting Information Systems in a comprehensive manner. This study is expected to provide knowledge related to artificial intelligence in the field of accounting as well as knowledge in the world of practice regarding the relationship of various dimensions in artificial intelligence technology to the efficiency of Accounting Information Systems.

LITERATURE REVIEW
New Management Accounting Theory
New Management Accounting Theory believes that in the era of artificial intelligence, financial personnel still have a good place to survive and thrive. Financial robots were invented by humans, and internal performance mechanisms were also prearranged by humans. Artificial intelligence technology only replaces programmatic and working mechanisms, and accounting thinking is irreplaceable (Li, Haohao, & Ming, 2019). A study conducted by Accenture in 2017 found that even with the advent of robo-advisors, 68% of customers prefer to use both human advisors and robo-advisors.

Artificial Intelligence (AI)
Artificial intelligence appeared as early as the Fifties of the twentieth century, when the scientist "Alan Turing" created what is now called the "Turing Test" to evaluate and clarify computer intelligence (Holzinger et al, 2019; Acemoglu and Restrepo, 2019). He et al (2019) see artificial intelligence as a scientific effort to facilitate human life by machine learning to simulate human mental abilities, and the way they work, further mastering human abilities through machines and giving the human mind the opportunity to think and be creative in other things, including solving problems, and developing various planning and strategic. Artificial intelligence can be explained by 3 dimensions (Duan et al, 2018; Haddad, 2021), namely expert systems, knowledge representation and inference, and machine learning.

Accounting Information System (AIS)
An accounting information system (AIS) is a set of interrelated elements, tools, procedures, devices and software that will interact together to complete financial data analysis, control, and supply when needed (Sari et al, 2019). Efficiency makes any institution capable of producing distinctive and brilliant services through the least available resources

and raw materials, in addition to producing good processes, and raising the level of institutions in the competitive market always all the time, and day (Oh and Ko, 2018). While (Beg, 2018) defines as a combination of people, machines, methods, and skills that come together to produce data and information for the benefit of work. Many factors and sub-systems work together in one trench to describe the right and correct information that helps the management of the institution in taking appropriate administrative policies and procedures in a system. The efficiency of the accounting system has various dimensions, including: complete information collaboration, complete information system linkage, accurate interpretation of business information, interpretation of the quality of accounting information, and comprehensive presentation of accounting information.

Influence of Expert System on Accounting Information System efficiency

Artificial intelligence is the ability of a system to accurately perceive external data, learn from it, and apply what has been learned to meet specific goals and tasks through flexible adaptation (Haenlin and Kaplan, 2019; cited in Zemankova, 2019). Expert systems are one of the dimensions in artificial intelligence (Duan et al, 2018; Haddad, 2021). Expert systems are easily and widely used for artificial intelligence technology which involves computer programming to simulate the way of thinking of an expert in a particular field (Chukwudi, 2018; Haddad, 2021). New Management Accounting Theory believes that in the era of artificial intelligence, financial personnel still have a good place to survive and thrive. The application of artificial intelligence realizes information and automation of accounting processes.

An accounting information system (AIS) is a set of interrelated elements, tools, procedures, devices and software that will interact together to complete financial data analysis, control, and supply when this is necessary (Sari et al, 2019). The efficiency of accounting information systems helps in varying knowledge and proficiency, thereby improving operations (Romney and Steinbart, 2013; Teru et al, 2016; Li Chaoyi et al, 2019). An efficient accounting information system helps in perfecting business transactions and effective decision making by users by providing substantial information at an accurate time (Beg, 2018; Haddad, 2021).

The application of expert systems can minimize human error in the accounting process. The system is designed to follow strict guidelines and rules in accounting, which results in more accurate financial statements (Kieso, 2019). Haddad, H., (2021) found that expert systems that are part of the artificial intelligence dimension have a positive effect on the excellence of accounting information systems by measuring the efficiency dimension of accounting systems. Similar studies were conducted by Hashem, F., et al (2021), found that artificial intelligence measured by one of them through the expert system dimension had a positive effect on the efficiency of accounting information systems. Also, Qasaimeh et al (2022) found that artificial intelligence using neural networks increases the efficiency of AIS and provides a basis for accounting information for management.

Thus according to New Management Accounting Theory that the application of expert systems in the accounting process is able to assist in the identification and handling of accounting problems more efficiently, which in turn increases the efficiency of the accounting process. So it can be concluded that expert systems have a one-way relationship with accounting information system efficiency. Based on the above explanation can be formed an alternative hypothesis 1, namely:

Ha1: expert system has a positive effect on accounting information system efficiency.

Influence of Knowledge Representation and Inference on Accounting Information System Efficiency

The knowledge representation and inference is one of the dimensions in artificial intelligence (Duan et al, 2018; Haddad, 2021). Knowledge representation and logical inference emerged in the field of artificial intelligence which is interested in how to represent knowledge symbolically and automatically process through thinking programs and it is informally the part of artificial intelligence that deals with thinking and how it contributes to intelligence behavior (Greenman, 2017; Haddad, 2021). New Management Accounting Theory believes that in the era of artificial intelligence, financial personnel still have a good place to survive and thrive. The application of artificial intelligence realizes information and automation of accounting processes.

An accounting information system is a set of interrelated elements, tools, procedures, devices and software that will interact together to complete financial data analysis, control, and supply when this is necessary (Sari et al, 2019). The efficiency of accounting information systems helps in varying knowledge and proficiency, thereby improving operations (Romney and Steinbart, 2013; Teru et al, 2016; Li Chaoyi et al, 2019). An efficient accounting information system helps in perfecting business transactions and enables effective decision-making by users by providing substantial information at an accurate time (Beg, 2018; Haddad, 2021).

The knowledge representation and inference in the form of a strong knowledge base allows accounting information systems to illustrate in-depth accounting knowledge. By having the right knowledge, this system can quickly assess and process financial data, make decisions based on relevant accounting rules, and provide accurate and precise financial reports. The knowledge representation and inference part of the artificial intelligence dimension contributes positively to the excellence of accounting information systems by measuring the efficiency dimension of accounting systems (Haddad, H., 2021). In addition, Hashem, F., et al (2021) in their study found that artificial intelligence as measured by one of them through the dimensions of knowledge representation and inference had a positive effect on the efficiency of accounting information systems. Also, Qasaimeh et al (2022) found that artificial intelligence using neural networks increases the efficiency of AIS and provides a basis for accounting information for management.

Thus according to New Management Accounting Theory that the application of knowledge representation and inference is able to increase efficiency in data processing, and identify accounting problems more quickly and accurately, which in turn increases the efficiency of accounting processes. So it can be concluded that the knowledge representation and inference have a one-way relationship with accounting information system efficiency. Based on the above explanation can be formed an alternative hypothesis 2 namely:

Ha2: knowledge representation and inference have a positive effect on accounting information system efficiency.

Influence of Machine Learning on Accounting Information System Efficiency

Machine learning is one of the dimensions in artificial intelligence (Duan et al, 2018; Haddad, 2021). Machine learning allows systems to learn and improve their performance automatically through experience without the need to be specifically programmed. This involves the use of computational algorithms that are able to learn from a variety of existing data, with the aim of recognizing the patterns that exist in the data the result is the ability of the system to make decisions and provide recommendations automatically (Helm et al., 2020). New Management Accounting Theory believes that in the era of artificial intelligence, financial personnel still have a good place to survive and thrive. The application of artificial intelligence realizes information and automation of accounting processes.

An accounting information system is a set of interrelated elements, tools, procedures, devices and software that will interact together to complete financial data analysis, control, and supply when this is necessary (Sari et al, 2019). The efficiency of accounting information systems helps in varying knowledge and proficiency, thereby improving operations (Romney and Steinbart, 2013; Teru et al, 2016; Li Chaoyi et al, 2019). An efficient accounting information system helps in perfecting business transactions and effective decision making by users by providing substantial information at an accurate time An efficient accounting information system helps in perfecting business transactions and enables effective decision-making by users by providing substantial information at an accurate time (Beg, 2018; Haddad, 2021).

Machine learning by automating routine tasks, such as transaction classification, forecasting, and pattern recognition in data, and subsequently making decisions with a minimum of human intervention in the process can result in improvements in the efficiency of financial data processing. Through machine learning algorithms that continuously learn from data, accounting information systems can become more advanced in addressing complex accounting challenges. Machine learning part of the artificial intelligence dimension contributes positively to the excellence of accounting information systems by measuring the efficiency dimension of accounting systems (Haddad, H., 2021). Hashem, F., et al (2021) found that artificial intelligence as measured by one of them through the dimension of machine learning has a positive effect on the efficiency of accounting information systems. Also, Qasaimeh et al (2022) found that artificial intelligence using neural networks increases the efficiency of AIS and provides a basis for accounting information for management.

Thus according to New Management Accounting Theory that the application of machine learning in accounting information systems can produce efficiency in processing financial data, and reduce human error in the accounting process, and ultimately the resulting financial statements to be accurate. So it can be concluded that machine learning have a one-way relationship with accounting information system efficiency. Based on the above explanation can be formed an alternative hypothesis 3 namely:

Ha3: machine learning has a positive effect on accounting information system efficiency.

As previously explained, this study will examine the effect of expert systems, knowledge representation and inference, and machine learning on accounting information system efficiency in Sharia Banking in Indonesia. Here is the conceptual framework of the study:
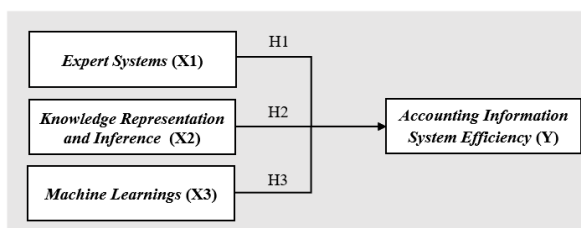

Figure 1: Conceptual Framework

METHOD
Selection of Samples and Data Sources
Sharia banking companies registered with the Financial Services Authority (OJK) in 2022 became the population in this study, consisting of Sharia Commercial Banks and Sharia Business Units. The sample of the study were managers, heads of financial and accounting departments, and senior accountants as its primary analytical unit representative of the enterprise. This study uses primary data with the determination of the sample is done by non-probability sampling. This study uses purposive sampling as a sampling technique. The

method of collecting research data in the form of a questionnaire technique using a likert scale that contains four levels of preference answer options are strongly disagree (STS), disagree (TS), agree (S), and strongly agree (SS). The selected respondents were determined based on the following criteria:

Table 1. Respondent Criteria

No	Grouping	Respondent Criteria
1	Department of Sharia Commercial Bank	1. Manager 2. Head of Finance and Accounting Department 3. Senior Accountant
2	Departments in the Unit Usaha Syariah	1. Manajer 2. Head of Finance and Accounting Department 3. Senior Accountant
3	Company specification	The company has implemented Artificial Intelligence in the company's operational activities.

Source: created by researchers, 2023

Empirical Model

This study uses multiple regression models to evaluate the impact of each independent variable on the dependent variable, as well as to measure the extent to which these variables explain the variation in accounting information system efficiency. The following is the statistical equation:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$$

Y : *Efficiency Accounting Information System*
β_0 : Konstanta
$\beta_1 - \beta_2$: Koefisien Beta
X_1 : *Expert Systems*
X_2 : *Knowledge representation and inference*
X_3 : *Machine Learning*

Operational Variables

1. Expert System (X1)

   Expert systems are defined as "techniques that work to find solutions" to problems that require specialized knowledge and skills, systems working in expert thinking styles, and motivations to imitate them (Kwat et al., 2021; Kerzel, 2021).

2. Knowledge Representation and Inference (X2)

   Knowledge representation and logical inference emerged in the field of artificial intelligence which is interested in how to represent knowledge symbolically and automatically process through thinking programs and it is informally the part of artificial intelligence that deals with thinking and how it contributes to intelligence behavior (Greenman, 2017; Haddad, 2021).

3. Machine Learning (X3)

   Machine learning is defined as the application of computer and mathematical algorithms adopted by way of learning derived from data and generating predictions in the future (Goldberg & Holland, 1988). Machine learning is a branch of artificial intelligence and computer science focused on using algorithmic data to model the way how humans learn and can gradually improve its accuracy (IBM, 2022; Raharja, 2022).

4. Accounting Information System Efficency (Y)

An accounting information system is a set of interrelated elements, tools, procedures, devices and software that will interact together to complete financial data analysis, Control, and supply when needed (Sari et al, 2019). The efficiency of the accounting system has five dimensions (Beg, 2018), including: collaboration of complete information, linkage of complete information systems, accurate interpretation of business information, interpretation of the quality of accounting information, and presentation of comprehensive accounting information.

Variable Measurement

Based on the Graham model (1999) which was also adopted by Haddad, H (2021); Hashem and Alqatamin (2021) artificial intelligence is measured using three dimensions, namely expert systems, knowledge representation and inference, and machine learning. Meanwhile, the efficiency of information systems is measured by using five dimensions, namely complete information collaboration, complete information system linkage, Accurate business information interpretation, Quality of accounting information interpretation, and presentation of comprehensive accounting information Comprehensive accounting information presentation (Thapayom, 1999; Haddad, H., 2021; Hashem and Alqatamin,2021)

RESULTS AND DISCUSSION

The number of questionnaires distributed to respondents was 60 to 33 Sharia Commercial Banks and Sharia Business Units in Indonesia. The questionnaires returned and can be processed are a number of 34 questionnaires. Respondents' answers to the questionnaires distributed to the companies under study were tabulated for the purpose of data analysis. The following table 2 presents a summary of the results of a descriptive analysis of all variables in the study.

Table 2 Descriptive Statistics of Each Construct

Konstruk	N	Min	Max	Mean	Std. Deviation
ES (X1)	34	1,600	4,000	3,177	0,574
KRI (X2)	34	2,250	4,000	3,300	0,533
ML (X3)	34	2,200	4,000	3,154	0,585
EAIS (Y)	34	1,429	4,000	3,306	0,531

Source: primary data processed,2023

Based on Table 2 of 34 respondents, the average value of the expert system (ES) variable is 3,177, where the average value is above point 3 of a scale of 1-4. This means that the respondent's answer about the use of expert system (ES) in Sharia Banking on average is agreed. While the standard deviation shows a value of 0,574, meaning that the average data distribution value of the expert system (ES) to 34 respondents is 0,574.

Variable knowledge representation and inference (KRI), machine learning (ML), efficiency accounting information system (EAIS) respectively the average value is equal to 3,300, 3,154, and 3,306. The three average values are at point 3 of a scale of 1-4. This means that as many as 34 respondents answered in agree about the use of knowledge representation and inference (KRI), machine learning (ML), accounting information system efficiency (EAIS) in their respective companies. The value of the standard deviation of the variable knowledge representation and inference (KRI) is 0,533, variable machine learning (ML) is 0,585, and variable efficiency accounting information system (EAIS) is 0.531.

Evaluation of Measurement Model Results (Outer Model)

Table 3. Measurement Model

Construct	AVE	Cronbach's Alpha	Composite Reliability
ES (X1)	0,533	0,781	0,797
KRI (X2)	0,550	0,728	0,737
ML (X3)	0,581	0,819	0,849
EAIS (Y)	0,566	0,939	0,944

Source: processed PLS output, 2023

Reliability test is a tool used to measure a questionnaire that contains the indicators of the research construct. The reliability value of a construct can be seen from cronbach's alpha, composite realibility (rho_a) and composite ealibility (rho_c) where all values must be above 0,70 which is considered consistent (reliable) (Fornell and Lacker, 1981; Nunnaly, 1978 in Ghozali, 2023). Table 3 shows that each construct of the study has a value of cronbach's alpha and composite realibility greater than 0,70. For this reason, each research construct is consistent (reliable).

Assessment of the outer model for research with reflective constructs whether it meets the conditions of convergent validity, then these two criteria can be used. First, the loading should be above 0,70. Also, the value of "p" is significant (0,50). In addition, it is also expected that loading into other constructs (cross loading) of lower value than to the construct (Hair et al in Sholihin, 2013: 65). Based on Table 4, it is shown that not all loading values are above 0,70 or there are several construct indicators with values between 0,60 and 0,70. However, for newly developed research for indicators with loading between 0,40 and 0,70 can be maintained as long as it does not reduce the value of the average variance extracted Ave and composite reliability (Hair et al.in Sholihin, 2013: 65). Thus, for all indicators meet the criteria of convergent validity.

Table 4. Outer Model Loading and Cross Loading

	ES	KRI	ML	EAIS
ES01	**0,606**	0,036	0,194	0,209
ES02	**0,676**	0,390	0,447	0,305
ES03	**0,786**	0,078	0,234	0,174
ES04	**0,767**	0,322	0,436	0,362
ES05	**0,797**	0,152	0,359	0,340
KRI2	0,179	**0,744**	0,687	0,641
KRI3	0,315	**0,682**	0,664	0,475
KRI5	0,201	**0,783**	0,600	0,593
KRI6	0,229	**0,754**	0,552	0,477
ML01	0,539	0,415	**0,612**	0,420
ML02	0,328	0,722	**0,836**	0,669
ML03	0,305	0,747	**0,745**	0,745
ML04	0,559	0,473	**0,696**	0,485
ML05	0,292	0,757	**0,891**	0,764
SI02	0,327	0,699	0,750	**0,768**
SI03	0,004	0,544	0,537	**0,630**
SI04	0,342	0,370	0,502	**0,609**
SI05	0,271	0,661	0,675	**0,853**
SI06	0,256	0,615	0,628	**0,815**

	ES	KRI	ML	EAIS
SI07	0,341	0,702	0,670	**0,702**
SI09	0,593	0,502	0,665	**0,643**
SI10	0,572	0,289	0,522	**0,622**
SI11	0,370	0,632	0,704	**0,890**
SI14	0,171	0,645	0,619	**0,826**
SI17	0,259	0,582	0,629	**0,820**
SI18	0,308	0,584	0,638	**0,875**
SI19	0,271	0,442	0,591	**0,716**
SI20	0,183	0,450	0,578	**0,679**

Source: processed PLS output, 2023

Assessment of discriminant validity is used to analyze the relationship between latent variables. The cross-loading values of each indicator are shown in Table 4. Based on the table, it is shown that the highest cross-loading of ice clumps in the ice construct, as well as the KRI clustering indicator in the KRI construct, the ML clustering indicator in the ML construct, and the EAIS clustering indicator in the EAIS construct. The Fornell-Lacker Criterion values for comparing the square root values of AVE, which must be greater than the correlation between constructs are presented in Table 5 below:

Table 5. Fornell – Lacker Criterion

	EAIS	ES	KRI	ML
EAIS (Y)	**0,753**			
ES (X1)	0,406	**0,730**		
KRI (X2)	0,748	0,303	**0,742**	
ML (X3)	0,836	0,488	0,846	**0,762**

Source: processed PLS output, 2023

Based on Table 5 on the diagonal line shows that the root value of AVE EAIS is 0,753 greater than the correlation value between ES-EAIS, KRI-ES, and ML-EAIS. The root value of AVE ES is 0,730 greater than KRI-ES, ML-ES, and EAIS-ES. While the root value of AVE KRI is 0,742 greater than the correlation value of ML-KRI, and ES-KRI. And finally, the root value of AVE is 0,762 greater than the correlation value between ES-ML. The correlation value of discriminant validity should be smaller than 0,85 (Fornell and Lacker, 1981; Nunnaly, 1978 in Ghozali, 2023). So because all AVE root values are below 0,85, it can be concluded that the constructs of EAIS, ES, KRI, and ML meet the validity of discrimination based on cross loading criteria, as well as Fornell-Lacker and HTMT.

Evaluation of The Structural Model (Inner Model)

Inner model testing provides hypothesis testing results from this study. This test is done after testing the outer model is done. The predictive power of the structural model can be seen from the value of the R-Square (R^2) of the endogenous variable (dependent variable). Changes in the value of R-Square can be used to explain the effect of certain exogenous latent variables to endogenous latent variables whether it has a substantive effect (Ghozali, H. I., & Kusumadewi, K. A., 2023).

R-Square (R^2)

Nilai R Square (R^2) is a measure of the proportion of the variation in the value of an endogenous variable that can be explained by an exogenous variable. The purpose of this analysis is to see from the research model built whether good or bad. The value of R-Square

(R²) consists of several criteria, including (a) the model is said to be substantial if the value of R-Square (R²) is 0,75, (b) the model is said to be moderate (medium) if the value of R-Square (R²) is 0,50, and (c) the model is said to be weak if it is 0,2 (Ghazali, 2023). The following are the results of the analysis of the value of R-Square (R²) of this study:

Table 6. Analysis Results R-Square (R²)

	R-square	R-square adjusted
EAIS (Y)	0,705	0,676

Source: Data Processed with SmartPLS 4.0

Based on the analysis in Table 6 that the value of R-Square (R²) is 0,705 and the value of R-Square Adjusted is 0,676. The meaning of the R-Square Adjusted value of 0,676 is that the ability of the variables ES, KRI, and ML in explaining the variable EAIS sebear 67,6%. Based on the existing criteria, this value is included in the moderate model.

Path Coefficients

Beta path coefficient is a value that is used to see the value of the path coefficient of the latent construct relationship. The results of research hypothesis testing are presented in Table 7 below:

Table 7. Research Hypothesis Testing Results

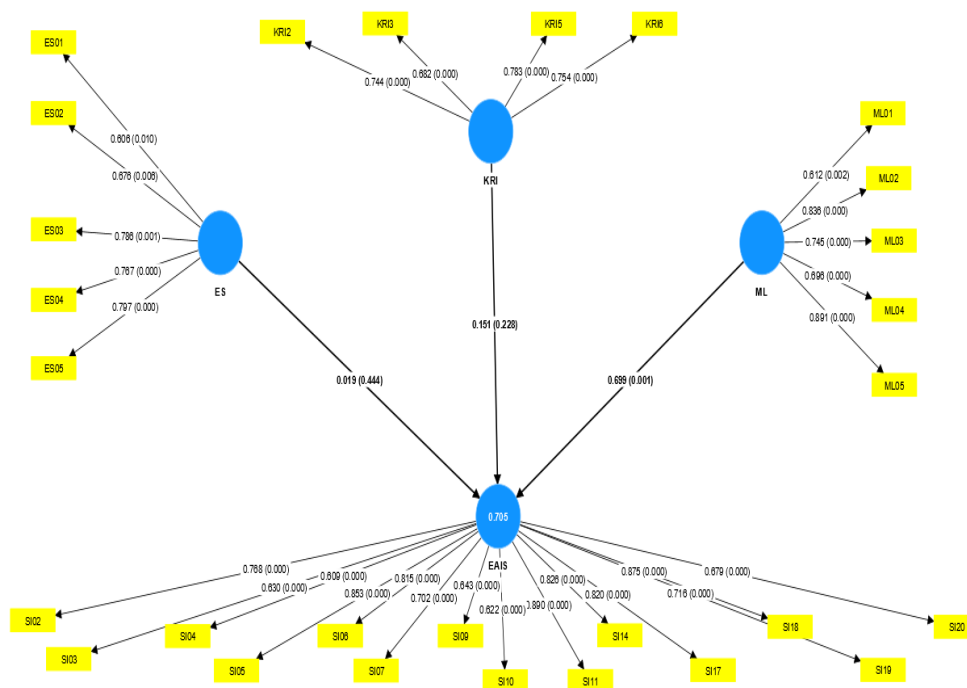| Hypothesis	Variable	Path Coefficient Beta	P-Value	Description
H1	ES => EAIS	0,019	0,444	Not Significant
H2	KRI => EAIS	0,151	0,228	Not Significant
H3	ML = > EAIS	0,699	0,001	Significant

Source: Output PLS, 2023

Figure 2. Results of Research Model Hypothesis Analysis

Influence of Expert System on Accounting Information System Efficiency.

Based on the results of data processing presented in table 7 shows that the path coefficient for hypothesis 1 (Ha1) is 0,019 and the p-value of 0,444 is not significant. This means that hypothesis 1 (Ha1) is rejected.

The results of this study indicate that the expert system in the Islamic banking industry has no influence on the efficiency of Accounting Information Systems. This indicates that not all dimensions of artificial intelligence that have been applied by the industry increase efficiency in completing financial data analysis through a set of elements called Accounting Information Systems. Above this it is possible that the expert system has not been or is not implemented by the company in the area that intersects with the accounting process directly.

These findings empirically do not support the New Management Accounting Theory that the application of artificial intelligence embodies the information and automation of accounting processes. These results are not in line with research conducted by Haddad, H (2021), & Hashem, F., et al (2021) that expert systems, which are one of the dimensions of artificial intelligence, have a positive effect on the efficiency of Accounting Information Systems.

The influence of Knowledge Representation and inference on Accounting Information System Efficiency

The test results for hypothesis 2 (Ha2) of this study are presented in Table 7. The path coefficient of this hypothesis is 0,151 and the p-value is 0,228. The Ha2 hypothesis was rejected.

Based on these results indicate that the application of artificial intelligence dimensions in the form of representation and inference of knowledge in the Islamic banking industry does not improve the efficiency of the accounting process. It is possible that the dimensions of representation and inference of knowledge cannot yet be applied in matters that intersect in full with the processing of accounting information of the Enterprise.

Empirically, this finding is not in line with the New Management Accounting Theory that the application of artificial intelligence embodies information and automation of accounting processes. These results are not in line with research conducted by Haddad, H (2021), & Hashem, F., et al (2021) that the representation and inference of knowledge which is one of the dimensions of artificial intelligence has a positive effect on the efficiency of Accounting Information Systems.

The Influence of Machine Learning on Accounting Information System Efficiency

The results of this hypothesis testing are presented in Table 7, where it is shown that the path coefficient value is 0,699 and the p-value is 0,001. This means that hypothesis 3 of this study is accepted.

Based on the results of this study shows that with the increasing application of machine learning dimensions in the Islamic Banking industry can improve the efficiency of Information Systems. This efficiency is formed because when machine learning is applied activities that contain a lot of human interference will be reduced so that during the processing of financial data there can be a minimum of human error. As well as, efficiency in the process of processing financial data can be achieved and have an impact on the adequacy of the resulting financial statements.

These findings empirically support the New Management Accounting Theory which states that the application of artificial intelligence embodies the information and automation of accounting processes. The results of this study are in line with research conducted by Haddad, H (2021), & Hashem, F., et al (2021) that machine learning which is one of the

dimensions of artificial intelligence has a positive effect on the efficiency of Accounting Information Systems.

CONCLUSION

The purpose of this study is to analyze the application of artificial intelligence dimensions in the realm of accounting and identify the relationship to the efficiency of Accounting Information Systems in Islamic Banking in Indonesia. Part of our hypothesis is consistent with previous research conducted by Haddad, H (2021), & Hashem, F., et al (2021) namely that machine learning which is part of the artificial intelligence dimension has a positive effect on the efficiency of Accounting Information Systems in Sharia Banking Companies in Indonesia. The application of machine learning in this industry by replacing only programmatic and working mechanisms without replacing accounting thinking in it is able to streamline the process of processing accounting information.

Not all aspects of the dimension of artificial intelligence has not been able to be applied in the realm of accounting in the Sharia Banking industry in Indonesia, this is evidenced by the results of research on the dimensions of the expert system and the dimensions of knowledge representation and inference does not affect the efficiency of Accounting Information Systems. Contrary to previous research conducted by Haddad, H (2021), & Hashem, F., et al (2021).

This study has some limitations. First, the number of respondents who were sampled could not fully represent the Sharia Banking industry in Indonesia because of the 33 Islamic Banks Registered with the OJK as of January 2023, both Islamic Commercial Banks and new Sharia Business Units, only 19 companies were willing to take part in this study. Second, the application of artificial intelligence is synonymous with the idea of cutting-edge technology based on databases, but this study has not limited how far each company invests in enterprise ERP technology. This is because given the limited information and time constraints. Therefore, in the future further studies should consider these things to be able to produce more comprehensive results.

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