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Article

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Article

The Determinants of the Usage of Accounting Information Systems toward Operational Efficiency in Industrial Revolution 4.0: Evidence from an Emerging Economy

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Abstract: The purpose of this study is to determine the factors affecting the application of accounting information systems (AIS) in small and medium enterprises (SMEs) in Vietnam. Drawing upon the Technology–Organization–Environment (TOE) theoretical framework, Diffusion of Innovations theory (DOI), and Resource-based theory (RBV), we proposed a research model to investigate the antecedents and influence of AIS usage in Vietnamese SMEs. This study used an online survey of individuals who work in Vietnamese SMEs for data collection. The result was assembled by applying the PLS-SEM model to test the proposed hypotheses based on 132 valid responses. First, the factors that have a significant impact on AIS usage are as follows: relative advantage; owner/manager commitment; and impact of COVID-19. Second, the research results also confirm that there is a positive relationship between AIS usage and AIS effectiveness; AIS performance has a positive impact on business performance. Research implications are to help business owners and leaders decide whether to use AIS to strengthen the company's position and reduce the burden on departments, particularly the accounting department.

Keywords: accounting information systems (AIS); AIS effectiveness; AIS usage; COVID-19



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1. Introduction

Accounting information is used by all commercial organizations, even nonprofits, to assist business stakeholders including management and outsiders such as investors, agencies, the government, and banks to attain certain objectives when making economic decisions (Hansen et al. 2007). Accurate accounting information is the foundation for assisting managers in making proper business decisions, orienting suitable operations on a regular basis, effectively operating and managing the firm, and maintaining excellent internal control. Particularly in current times, such as IT 4.0, which is the era of digital technology, everything is connected to the Internet. The Fourth Industrial Revolution is the trend towards automation and data exchange in manufacturing technologies and life (Hermann et al. 2016). Information technology makes it easier for individuals to execute their tasks, saves money, and manages high efficiency whilst also providing timely and reliable information. As a result, with the advent of current information technology, the proper operation and management of a firm is now required. The accounting information system, in particular, is a world-class information technology tool that focuses on processing accounting data and successfully assisting managers in decision making.

Many research studies on the use of AIS have been undertaken all around the world. However, no specific research has been undertaken to examine the relationship between

AIS effectiveness and company operational efficiency, particularly in the current context, the impact of external agents, the COVID-19 pandemic, and whether or not the enterprise's use of AIS is affected. In Vietnam, there are studies on the application of accounting information systems, although they are still fairly limited. The majority of these studies are concerned with the analysis of constraints in AIS development, the application of AIS in enterprises, and so on, in order to make recommendations and solutions. Among the notable overseas studies is a study on the factors influencing the use of AIS in small and medium-sized businesses (Lutfi et al. 2017). The results reveal that the elements influencing the implementation of AIS are as follows: organizational readiness, competitive pressure, compatibility, owner/manager commitment, and government support. In addition, there is a study on the elements influencing the effectiveness of AIS (Kouser et al. 2011) conducted in the context of Pakistan. According to the findings, there are two important drivers of AIS effectiveness: manager participation in AIS implementation and manager accounting knowledge. Moreover, Ali et al. (2012) conducted research on the intention of small and medium-sized businesses to continue using AIS (Ali et al. 2012). The study results show that relative advantage is the biggest predictor of attitude toward AIS and satisfaction, both of which have significant mediation impacts on the intention to continue using AIS. Outstanding domestic research studies the implementation of accounting information systems in Vietnamese small and medium firms using the core components of AIS (Tu 2020). The results that designate three elements have the largest influence on AIS usage: persons, information technology infrastructure, and internal control systems. In general, no research has been conducted to analyze the relationship between AIS effectiveness and a company's operational efficiency (Tu 2020). There are a few domestic research studies on the factors influencing the deployment of AIS; in particular, in the context of the COVID-19 epidemic, new technology, digitization, and automation are increasingly popular in Vietnam.

In Vietnam, achievements in accounting information systems are now more widely used, such as Enterprise Resource Planning systems (ERP) and Cloud Computing (CISCO 2020). Vietnamese business executives are aware of the need of digital transformation (Vietnam News 2021). More than 60% of SMEs use accounting software, and over 200,000 enterprises employ electronic invoices (Vietnam News 2021). Accounting professionals taking place in 22 nations around the world, including Vietnam, demonstrate that the following: Trends are projected to have the greatest impact in the next three to ten years, according to up to 55% of survey respondents stating that the development of automated accounting systems is regarded as having the most potential (ACCA_GLOBAL 2016). Vietnamese enterprises from various businesses have all used AIS in accounting and management. In recent years, the accounting software market in our country has also been fairly active. It is estimated that there are more than 130 accounting software suppliers legally. Moreover, as the digital economy evolves, new business forms and payment methods emerge, and economic transactions become more complicated and diverse, resulting in ongoing changes in the accounting record system promulgated and updated by the State to be relevant and timely with economic development. Despite the strong development trend, the State's support, and the benefits of AIS, the level of AIS usage in Vietnamese firms remains relatively low compared with countries in the same region (CISCO 2020).

The study aim is to fill research gaps by analyzing and identifying the elements influencing the implementation of AIS. The research is carried out in the context of Vietnam, a developing country with great economic achievements. Economic reforms since the launch of Doi Moi in 1986, coupled with beneficial global trends, have helped propel Vietnam from being one of the world's poorest nations to a middle-income economy that leads a group of countries with similar incomes in one generation. Thanks to its solid foundations, the economy has proven resilient through different crises, the latest being COVID-19 (Word Bank 2021). Vietnam was one of only a few countries to post GDP growth in 2020 when the pandemic hit (Word Bank 2021). The COVID-19 epidemic, on the other hand, has a negative impact on the Vietnamese economy (Word Bank 2021). Due to the strong outbreak of the epidemic wave, social distancing and stringent blockade had to be

applied on a constant basis for people's safety, severely affecting production and economic activity in many fields (Word Bank 2021). Businesses face numerous difficulties and the possibility of insolvency when there is little revenue while operational costs are high (Word Bank 2021). Small and medium-sized businesses, in particular, play an essential role in the Vietnamese economy, accounting for a large proportion. Small and micro firms make up a sizable share of this total (Word Bank 2021). Because of its tiny size, this company sector is extremely vulnerable to the devastating impact of the COVID-19 pandemic, which could force it out of the market (Word Bank 2021). This study also makes significant theoretical contributions by integrating three theories: the Technology–Organization–Environment model, Diffusion of Innovations theory, and Resource-based theory in building a research model. PLS-SEM will be used to test and identify the factors influencing AIS usage in SMEs, as well as confirm the influence of that application on AIS effectiveness and the relationship between AIS effectiveness and business operational efficiency.

The remainder of the research is organized as follows: Section 2 provides a theoretical summary based on prior research. Section 3 provides a thorough theoretical foundation as well as research assumptions. Section 4 describes the research model and methodologies. Section 5 contains the outcomes of the data analysis and discussion. Section 6 then closes with implications, limitations, and further studies.

2. Literature Review

Some studies conducted a study on the factors affecting the use of AIS and examined the influence of AIS use on the effectiveness of AIS in the context of small and medium enterprises (SMEs) (A Ali and AlSondos 2020; Ali et al. 2012, 2016; Henderson et al. 2012; Khairi and Baridwan 2015; Kouser et al. 2011; Lutfi et al. 2017, 2020). The proposed research model is based on Resource theory, the TOE research model and TAM. The proposed hypotheses refer to the effective use of AIS in SMEs, the relationship between them, and the role of enterprises and identify a significant gap with previous studies when very few studies were able to explain the impact of AIS use on AIS effectiveness (Lutfi et al. 2020). According to the results of one study, influential factors for the use of AIS are as follows: competitive pressure, compatibility, owner/manager commitment, government support, and business benefits. The results also demonstrate that the use of AIS has a significant effect on the effectiveness of AIS (Lutfi et al. 2017, 2020). Another study discovered two significant predictors of AIS effectiveness: management involvement in AIS implementation and management accounting knowledge (Kouser et al. 2011). Another group of authors developed more widely deployed variables from the underlying theories, such as attitude, pre-satisfaction, and intention to continue, and baseline variables deployed in the model, in addition to having the effect of money on behavior mediated by attitudes and utility and demonstrating that relative advantage is the strongest antecedent of attitudes toward AIS and satisfaction, both of which have a significant impact on the retention of intent (Ali et al. 2012). Another study confirmed that having the right accounting information system in place provides you a competitive advantage; causal relationships have been established between accounting information systems and performance; the current study's findings were presented; and other areas of research were also discussed (A Ali and AlSondos 2020). According to the findings of a study, service quality, information quality, and system quality are important success factors for AIS in increasing organizational performance (Ali et al. 2016). The study also shows that culture organizations help increase performance by interacting with information quality, data quality, and system quality; thus, businesses should create a favorable environment for employees to feel happy, which motivates them to work more diligently for the organization (Ali et al. 2016). According to one study, the following factors influence AIS adoption: management support on perceived ease of use, management support on perceived usefulness, self-efficacy on perceived ease of use, self-efficacy on perceived usefulness, perceived usefulness on the behavioral intention of using AIS, and perceived ease of use on the behavioral intention of using AIS (Khairi and Baridwan 2015).

In general, these studies have shown that the factors affecting the use of AIS in SMEs include the relative advantages of using AIS, which will limit the problems arising and bring about higher efficiency; the readiness of the business is reflected in the relevant aspects; the commitment of the owners/managers on the future direction with the actual impacts of AIS; the support from the government shown through the policies and regulations to encourage the use of AIS in business; the use and effectiveness of AIS to meet business needs; the impact of COVID-19 promotes technical development to improve labor efficiency; operational effectiveness and efficiency come from the business, its employees, and customers.

3. Theoretical Framework and Hypothesis Development

3.1. Theoretical Framework

3.1.1. Technology–Organization–Environment (TOE)

Concerning the use of technology in organizations, the theory explains the interaction of three factors: technology context, organizational context, and environmental context, TOE (the technology–organization–environment framework) (Tornatzky et al. 1990). This theory has been revisited for its broad applicability (Awa et al. 2017), with the results indicating that the theory’s application has a direct relationship, meaning statistical significance with the application possibilities of new technology. The paradigm emphasizes higher-level characteristics rather than the specific behaviors of individuals within the organization. TOE is the foundation for studying the application of new technology to businesses, as well as understanding the application of technology at the individual level through behavioral models such as theory of rational action and theory of behavior. There are plans and models for integrating technologies that should be used.

3.1.2. Diffusion of Innovations (DOI)

DOI is a hypothesis that describes how a new technology advances and spreads throughout society as well as penetrates culture, beginning with gender identity and spreading in people’s consciousness (Rogers 2010). Product introduction in preparatory work for the acceptance of DOI is viewed as the pioneer for explaining aspects of ICT innovation adoption in the field of Library and Information Science (LIS) (Minishi-Majanja and Kiplangat 2005). Theory attempts to explain why new and experimental ideas are accepted over time and spread over long periods of time. The combination of rural and urban populations in a society, the level of education in the society, and the scale of industrialization and development are all factors that influence the rate of innovation diffusion. Adoption rates may differ between societies. The diffusion of a new idea is influenced by four factors, according to the following theory: the level of improvement, the channel of communication, the time of adoption, and the social system (situation).

3.1.3. Resource Based View Theory (RBV)

According to the resource-based view (RBV), each independent organization has specific resource structures such as physical assets, its ability to own or control its assets, which are considered separate resources arising from the organization’s history of formation and development capacity (Barney 1991). The study of RBV is a typical example of the widespread application and demonstration of this theory in economics (Acedo et al. 2006). Over the last decade, the use of resource-based theory (RBT) in marketing research has increased by more than 500%, demonstrating its importance as a framework for explaining and predicting competitive advantage and performance results (Kozlenkova et al. 2014).

Material resources include finance, factories, technology, and equipment systems; (2) immaterial resources include (1) trademarks, licenses, reputations, network partnerships, and databases; and (3) competencies include knowledge, organizational ability to use fixed assets, observation of business opportunities, ability to produce new knowledge based on existing knowledge, and ability to innovate production (Baumane-Vitolina and Cals

2013). Furthermore, resources are classified into two types: knowledge-based resources and relationship-based resources.

3.2. Hypothesis Development

Many organizations have considered the advantages that come from using such novelties by using the concept of relative advantage in Diffusion of Innovation (DOI) theory when adopting new technology (Henderson et al. 2012; To and Ngai 2006). This fit is preferable to the predecessor (Rogers 2010). In the context of AIS, enterprise use of AIS is preferable to non-use (Khairi and Baridwan 2015; Lutfi et al. 2020). It should be noted that the main motivation for SMEs to adopt new technologies is that the benefits are expected to benefit the company (Ali et al. 2012; Lutfi et al. 2020). The study hypothesized, based on the reasons given, the following.

Hypothesis 1 (H1). *Relative Advantage has positive influences on the use of AIS.*

The potential benefits alone are not always enough to convince an organization to adopt a new technology. According to the Technology–Organization–Environment (TOE) model theory, organizational factors influence the application of technology (Lutfi et al. 2020; Maryeni et al. 2014). As a result, whether firms are willing to use new technology effectively is an important organizational factor to consider (Ali et al. 2012; Lutfi et al. 2020). In the case of SMEs, they may be hesitant to implement AIS if they are not prepared to face the potential risks associated with its use (Lutfi et al. 2020; Ramdani and Kawalek 2007). Employees' positive attitudes prior to implementing a new system are also critical during implementation (Ali et al. 2012). Similarly, one of the major determinants of AIS adoption is organizational readiness (Lutfi et al. 2020; Rahayu and Day 2015). As a result, the following hypothesis is developed:

Hypothesis 2 (H2). *Organizational Readiness has positive influences on the use of AIS.*

Owner or manager commitment (OMC) is another factor in the Technology–Organization–Environment (TOE) model theory, indicating that they are involved in system planning and implementation. They not only ensure that such technologies are used by their employees, but they also have a positive impact on the success of IS/IT in SMEs (Lutfi et al. 2020). Due to the natural resistance of technology use, it is critical when making decisions to ensure that they are committed to properly implementing all available resources to make good use of AIS (Grover and Goslar 1993; Nasiren et al. 2016; Rozzani and Rahman 2013). As a result, OMC is an important factor in the use of AIS (Al-Alawi and Al-Ali 2015). The following is our next hypothesis.

Hypothesis 3 (H3). *Owner/Managers Commitment has positive influences on the use of AIS.*

Another important factor that may have an impact is government support for the TOE model's environmental component, which involves the government's role in encouraging and promoting the use of technology in business (Tornatzky et al. 1990). The study also suggests that different government policies and regulations can influence businesses' adoption of AIS. Many studies have taken this factor into account, and the results consistently show the importance of government support in the use of technology by businesses (Al Nahian Riyadh et al. 2009; Ali et al. 2012; Lutfi et al. 2020; Zhu and Kraemer 2005). The following is the next hypothesis proposed by the study:

Hypothesis 4 (H4). *Government Support has positive influences on the use of AIS.*

The ultimate goal of using AIS is to improve company performance; companies that use AIS effectively are more likely to report positive results (Ali et al. 2012). Similarly, TOE theory suggests that the impact of a technology is determined by how much it is used to

conduct business activities (Lutfi et al. 2020; Zhu et al. 2006). As a result, a company must first use AIS in order to understand its impact on the effectiveness of AIS. As a result, the following hypothesis is advanced:

Hypothesis 5 (H5). *AIS Usage has positive influences on the effectiveness of AIS.*

We have observed the importance of technology in the difficult global COVID-19 pandemic over the last two years (Beland et al. 2020; Spurk and Straub 2020; Stuerz et al. 2020). Accepting new technology as part of daily routine is critical in this context (Momani et al. 2017). Technology adoption is regarded as one of the most important success factors for new technology (Molino et al. 2020; Scherer et al. 2019). To meet demand, technology has undergone stronger transformations to keep up with the times; COVID-19 is regarded as a driving force for technological development; many new business models have emerged, and online business and e-commerce platforms are becoming more popular (Pedró 2020). Furthermore, COVID-19 promotes and upgrades technology and automation infrastructure systems, including AIS infrastructure. Based on the data presented above, the study hypothesizes the following.

Hypothesis 6 (H6). *COVID-19 has positive influences on the effectiveness of AIS.*

When it comes to customer satisfaction, an effective business can be assessed through satisfaction, which means that the business is operating effectively in some manner. Employees' professional ethics, on the other hand, are used to evaluate performance (Ali and AlSondos 2020). Furthermore, in order to evaluate operational efficiency, it is necessary to pay attention to the growth of factors such as market share, revenue, and profit of the enterprise, if even after the implementation of new technology such as AIS, these indicators of growth have increased. It is undeniable if the business is constantly growing (Ali et al. 2016, 2020; Koli and Rawat 2011; Rozzani and Rahman 2013). We propose the following research hypothesis.

Hypothesis 7 (H7). *AIS effectiveness has positive influences on operational efficiency.*

4. Research Design

4.1. Scale and Structure of the Questionnaire

This study was conducted to briefly understand the factors affecting the application of AIS in SMEs in Vietnam. When analyzing by the PLS-SEM method, the required sample size is at least 80 (Hair et al. 2016). We conducted an online quantitative survey sent to individuals who have been and are working in SMEs in Vietnam, during the period from September to November 2021. The results obtained 132 valid questionnaires, which are more than the minimum sample size and meet the research requirements. The questionnaire consists of 3 parts. Part 1 is personal information, part 2 is business information, and part 3 is quantitative questions about factors affecting the application of AIS in SMEs in Vietnam. To determine the influence of factors in the study, we use the Google questionnaire with three main parts with eight variables. The first variable is the relative advantage of using AIS, which we study based on the scale (Premkumar and Roberts 1999; Rogers 2010). Next, we apply the scale of Grandon and Pearson (2004) to measure the readiness of the business (Grandon and Pearson 2004). For the commitment variable of owners/managers, we apply the scale of (Damanpour and Schneider 2006). Tornatzky et al. (1990) is the subsequent study for us to make the scale of the government support variable (Tornatzky et al. 1990). For the use of AIS, we relied on the do-scale of (Bhattacharjee 2001a, 2001b; Limayem and Cheung 2008). For the efficiency variable using AIS, we used the scale of the (McMahon 2001). We use the scale of (Beland et al. 2020; Nagel 2020; Pedró 2020) to measure the impact of COVID-19 on AIS performance. To measure the impact of AIS performance on business

performance, we use the scale of (A Ali and AlSondos 2020). Appendix A Table A1 will contain information on measuring scales.

4.2. Methodology

The scale of the study is built based on our research on the combination of the theoretical basis of the TOE model and the results obtained from previous studies mentioned in the research hypotheses above, then it is adjusted to fit the actual situation. The quantitative scales built in the article will measure the perceptions of the survey subjects by using a Likert scale with five levels: 1—Strongly disagree; 2—Disagree; 3—Neutral; 4—Agree; 5—Strongly agree.

Available survey samples will be processed using SPSS 20.0 and SmartPLS software to perform the analysis steps of the PLS-SEM model. PLS-SEM analysis has the advantage of emphasizing forecasting goals while being similar in terms of data needs and relationship characteristics, being able to compute combinations of observed variables using as a representative of the concepts in the study, the model is also not constrained by the identification problem, even when the model becomes complex (Hair et al. 2017). Furthermore, PLS-SEM can better handle causal modeling and has advantages when the sample is relatively small (Hair et al. 2017).

PLS-SEM works efficiently with small sample sizes and complex models (Hair et al. 2021). PLS-SEM can easily handle reflective and formative measurement models, as well as single-item constructs, with no identification problems (Hair et al. 2021). It can, therefore, be applied in a wide variety of research situations (Hair et al. 2021). When applying PLS-SEM, researchers also benefit from high efficiency in parameter estimation, which is manifested in the method's greater statistical power in comparison to that of CB-SEM (Hair et al. 2021). No distributional assumptions are made; PLS-SEM is a nonparametric method. Influential outliers and collinearity may influence the results (Hair et al. 2021).

4.3. Research Model

Based on the background theory and arguments from the research hypotheses, we propose the research model presented in Figure 1.

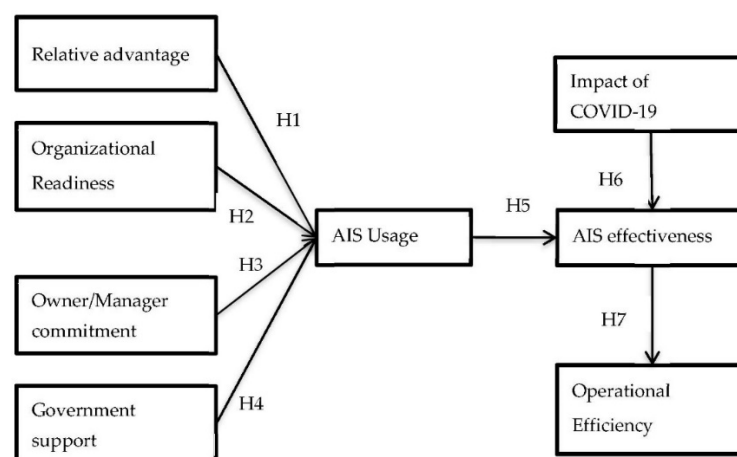


Figure 1. Research model. Source: proposal from the author.

5. Results

5.1. Descriptive Statistics

All qualitative variables of the survey, including personal information of survey subjects and business information, were subjected to descriptive statistical analysis, and the findings revealed the level of spread across all components. The survey findings are gathered, demonstrating that the survey results are unaffected by any special factor or variable in determining the factors influencing the business using AIS. The specific results are presented in Table 1.

Table 1. Summary of statistical results describing qualitative variables.

Category	Percentage
Gender	
Female	61.36%
Male	38.64%
Total	100%
Age	
18–24	66.67%
24–35	26.51%
35–45	3.03%
45 and above	3.79%
Total	100%
Work experience	
5 years or less	83.33%
6–10 years	9.85%
11–15 years	1.52%
More than 15 years	5.30%
Total	100%
Average income per month	
Under 10 million	59.85%
10–20 million	29.55%
20–40 million	6.05%
Over 40 million	4.55%
Total	100%
Living place	
Ha Noi	1.52%
TP.HCM	86.36%
Đà Nang	1.52%
Others	10.60%
Total	100%
Position	
Staff	86.36%
Manager	11.36%
Chief executive officer	1.52%
Senior manager	0.76%
Total	100%
Academic level	
College	5.30%
University	89.40%
Post-university	5.30%
Total	100%

Table 1. *Cont.*

Category	Percentage
Type of business	
Mining industry	9.85%
Retail	23.48%
Repair of other cars and engines	0.76%
Accommodation and food service	48.48%
Water supply and waste treatment	1.52%
Energy and mining	2.27%
Transportation, warehousing, and construction	6.06%
Electronic technology	7.58%
Total	100%
Age of business	
1–5 years	27.27%
6–10 years	22.73%
11–20 years	19.70%
More than 20 years	30.30%
Total	100%
Number of employees	
Under 10 people	11.36%
10–99 people	27.27%
100–199 people	14.39%
200–300 people	9.10%
More than 300 people	37.88%
Total	100%

Source: Author synthesized from research data.

During the entire survey process, the team obtained 132 forms with 132 valid forms. The outcomes are described in detail below. The first information about individuals in the survey was gathered through the observation of variables such as gender, age, work experience, average income per month, living place, position, and academic level. For gender, males accounted for 38.64%, while females accounted for 61.36%. The sample survey is then sent to all age groups and collects the opinions of all subjects in the factor group, with the age group 18–24 receiving the highest response rate of 66.67%. Similarly with respect to age and work experience, the proposals are dominated by groups with 5 years or less, with 83.33%. The subjects' average income per month was also distributed evenly, with income under 10 million accounting for the largest proportion (59.85%). In terms of living place, the majority of those polled (86.36%) live in Ho Chi Minh City. The majority of positions (86.36%) are held by employees, but higher-ranking positions (Manager 11.36%, Chief executive officer 1.52%, and Senior Manager 0.76%) are also represented in the survey. The academic level is the final information factor. Up to 89.40% of subjects have university level education, while the rest have college and post-university education equivalent to 5.30%. For business information, three items can be displayed: the type of business, the age of the business, and the number of employees. In terms of the age of business factor, businesses arranged at similar time levels were divided into four groups ranging from 19.70% to 30.30%. Regarding the type of business surveyed, the results shown in Table 1 show that there are many types of businesses surveyed, with a few types accounting for the most, such as Accommodation and food service with 48.48%

and Retail with 23.48%, but these two figures account for many parts (not the majority), and the remaining types of businesses still participate in the survey with corresponding proportions. Similarly, for equally important information, the number of employees is also diversified from the sample survey when five groups of numbers have a ratio of 9.10–37.88%; there is no company in which the group is too large. We find that the sample was overall similar, making the results more reliable, and this stems from two factors: type of business and number of employees, which are diverse in most types and sizes, and the remaining factors do not have a single factor that is dominated by business groups.

5.2. Check Measurement

The data are evaluated for convergent validity, discriminant validity, and reliability by the measurement model. The parameters of Average Variance Extracted (AVE), Composite Reliability (CR), Cronbach's Alpha, and Discriminant Value are highlighted in detail. The hypothesis was given a 5 percent significance level. There was a greater than 0.70 load factor (Wong 2013). AVE should be more than 0.5 according to (Fornell and Larcker 1981). The AVE estimate from SmartPLS was 50% higher for all factors in this investigation. The discriminant value as the square root of AVE is also bigger than the other associated variables and lies on the same diagonal as the other correlated variables.

According to the study's measurement model, the values of Composite reliability, Cronbach's alpha reliability value, and Discriminant value determined from the collected survey data are completely suitable for the inclusion of scales in structural model analysis.

Tables 2 and 3 show the findings of the survey data measurement model analysis. Table 2 shows that all of the study variables are acceptable, and the model is viable, with Cronbach's alphas ranging from 0.819 to 0.942, exceeding the threshold of 0.70 (Churchill 1979). The CR value is substantially higher than the 0.7 level (Nunnally 1978), ranging from 0.892 to 0.953. AVE values range from 0.690 to 0.856, far exceeding the minimum of 0.5, when evaluated for Discriminatory Values in Table 3. The square root of AVE always lies on the diagonal and is greater than all the remaining values of the correlated variables in the model, indicating that the value here is the discriminant value, which is completely consistent with Fornell and Larcker's (1981) opinion.

Table 2. Convergent validity and reliability.

Var	Item	Factor Loading (>0.7)	AVE (>0.5)	CR (>0.7)	Cronbach's Alpha (>0.7)
RA	RA1	0.899	0.734	0.892	0.819
	RA2	0.790			
	RA3	0.876			
RD	RD1	0.900	0.790	0.918	0.869
	RD2	0.925			
	RD3	0.839			
OMC	OMC1	0.841	0.727	0.941	0.924
	OMC2	0.870			
	OMC3	0.882			
	OMC4	0.891			
	OMC5	0.857			
	OMC6	0.769			
GS	GS1	0.871	0.799	0.923	0.874
	GS2	0.903			
	GS3	0.908			

Table 2. *Cont.*

Var	Item	Factor Loading (>0.7)	AVE (>0.5)	CR (>0.7)	Cronbach's Alpha (>0.7)
CV	CV1	0.906	0.856	0.947	0.916
	CV2	0.939			
	CV3	0.930			
AISU	AISU1	0.859	0.742	0.953	0.942
	AISU2	0.871			
	AISU3	0.870			
	AISU4	0.882			
	AISU5	0.872			
	AISU6	0.876			
	AISU7	0.796			
AISE	AISE1	0.879	0.769	0.952	0.940
	AISE2	0.891			
	AISE3	0.902			
	AISE4	0.870			
	AISE5	0.871			
	AISE6	0.848			
OE	OE1	0.871	0.690	0.917	0.887
	OE2	0.813			
	OE3	0.820			
	OE4	0.799			
	OE5	0.847			

Table 3. Discriminant validity.

	AISE	AISU	CV	GS	OE	OMC	RA	RD
AISE	0.877							
AISU	0.765	0.861						
CV	0.683	0.630	0.925					
GS	0.548	0.572	0.558	0.894				
OE	0.585	0.593	0.607	0.530	0.831			
OMC	0.706	0.688	0.665	0.644	0.647	0.853		
RA	0.626	0.640	0.594	0.644	0.522	0.649	0.856	
RD	0.594	0.565	0.575	0.552	0.551	0.698	0.577	0.889

Source: Author synthesized from research data.

5.3. Structural Model

Based on the results of Tables 4 and 5 and Figure 2, hypotheses H1, H3, H5, H6, and H7 are accepted because they have positive path coefficients and a *p*-value of less than 5%. In the study model, hypotheses H2 and H4 are rejected because their *p*-values do not meet the significance level of less than 5%. The adjusted R-squared values for the three dependent variables AISU, AISE, and OE are 0.532, 0.647, and 0.337, respectively, indicating that variables such as relative advantage and owner/managers commitment can explain up to 53.2 percent of the significance of AIS usage. The AIS usage variable may explain up to

64.7 percent of the AIS efficiency variable's significance, and the AIS efficiency variable can explain 33.7 percent of the operational efficiency variable's significance. Almost all of the hypotheses that were established were found to be validated by the findings. However, the findings show that there are up to two assumptions concerning two independent elements, namely organizational readiness and government support, that are not recognized in the process of influencing AIS adoption. Finally, the results show that only two aspects of relative advantage and owner/managers commitment in the proposed research model have an influence on the use of AIS in SMEs.

Table 4. R square adjusted.

	Var	R Square Adjusted
AISU	AIS Usage	0.532
AISE	AIS Effectiveness	0.647
OE	Operational Efficiency	0.337

Source: Author synthesized from research data.

Table 5. Hypothesis Results.

Hypothesis	Path	Coefficient	T-Stat	p-Values	Conclusion
H1	RA → AISU	0.279	2.707	0.007	Supported
H2	RD → AISU	0.079	1.035	0.301	Not Supported
H3	OMC → AISU	0.389	3.700	0.000	Supported
H4	GS → AISU	0.098	0.948	0.344	Not Supported
H5	AISU → AISE	0.556	5.602	0.000	Supported
H6	CV → AISE	0.333	3.507	0.000	Supported
H7	AISE → OE	0.585	6.561	0.000	Supported

Source: Author synthesized from research data.

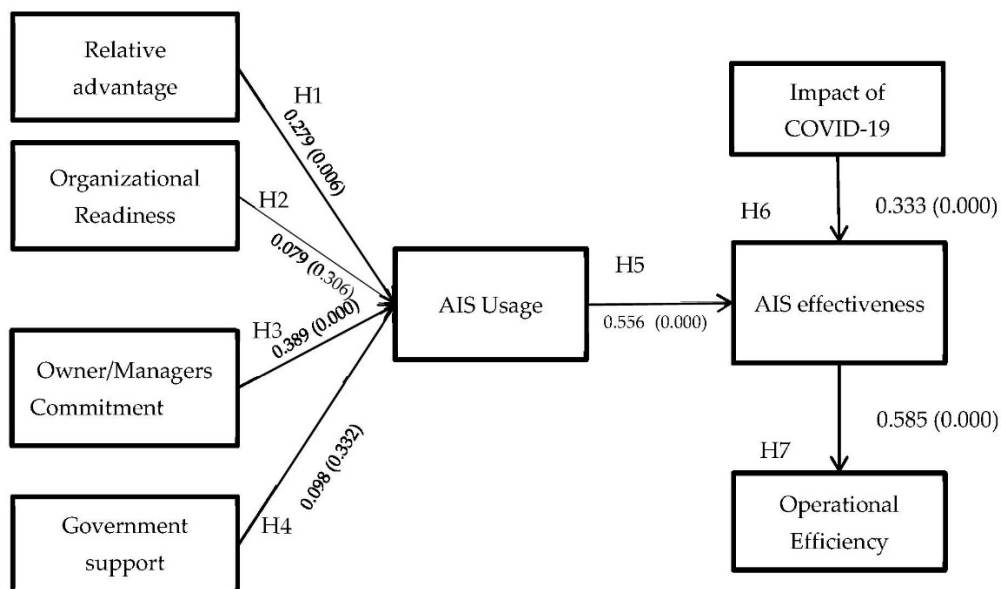


Figure 2. Structural Model.

Because the *p*-value is less than 0.05, the T-stat value is more than 1.96, and the path coefficient value is positive, the proposed hypotheses H1, H3, H5, H6, and H7 are accepted and have a positive effect. H1 is acceptable because the Relative Advantage factor has a positive effect on AIS use (Coefficient = 0.279, T-stat = 2.707, *p*-value = 0.007). For H3, there is a positive association between Owner/Managers commitment and AIS utilization

(Coefficient = 0.389, T-stat = 3.700, p -value = 0.000). H5 is also approved because the data reveal that using AIS has a beneficial effect on AIS Efficiency (Coefficient = 0.556, T-stat = 5.5602, p -value = 0.000). Finally, two hypotheses H6 (Coefficient = 0.333, T-stat = 3.507, p -value = 0.000) and H7 (Coefficient = 0.585, T-stat = 6.561, p -value = 0.000) are accepted because there are satisfactory values, confirming the hypotheses H6 and H7 that AIS usage positively affects AIS Effectiveness and AIS Effectiveness positively affects Operational efficiency. Meanwhile, hypotheses H2 and H4 are rejected because the T-stat value is less than 1.96 and the p -value is greater than 0.05, implying that organizational readiness and government support have no effect on SMEs' use of AIS.

6. Discussion

According to the findings, relative advantage and owner/managers commitment are two factors that have a positive impact on AIS usage in SMEs. This means that of the four hypotheses H1–H4 about the factors influencing AIS usage, H1 and H3 are consistent with our original opinion. Regarding such findings, the relative advantage factor that influences the use of AIS is consistent with the findings of (Ali et al. 2012), and this factor has a positive effect on AIS usage but this result is not consistent with the findings of (Lutfi et al. 2020). According to this study, the relative advantage factor has no effect on AIS usage. Concerning the owner/managers' commitment, which is a factor influencing enterprise adoption of AIS, it is completely consistent with the conclusion of (Lutfi et al. 2020). The use of AIS is not a trivial matter; therefore, businesses must consider the benefits of using AIS versus not using it, the advantage that businesses gain from adopting A is that it outweighs the cost of implementation or it increases the business's competitive advantage. Furthermore, if SMEs' managers or owners believe that the benefits of implementing advanced technology systems outweigh the risks, they are more likely to implement technology. The commitment of managers is the motivation for employees to adopt these new technologies. This also implies that the levels of commitment, active participation, and support of the business management in adopting AIS and ensuring the use of such technologies by its employees are extremely important factors in the adoption of AIS (Ali et al. 2012; Lutfi et al. 2020).

The hypothesis that AIS usage has a positive effect on AIS use efficiency is entirely consistent with the conclusion reached by (Lutfi et al. 2020). In terms of AIS effectiveness, research shows that using AIS effectively helps businesses collect reports that have a greater positive impact on their operations than businesses that use AIS infrequently or not at all (Ali et al. 2012). When businesses use technologies such as AIS in their work, the technologies must undoubtedly bring efficiency and benefits to the businesses, and the businesses must use AIS in order to recognize a positive relationship between the use of AIS and the effectiveness of AIS. From there, it is concluded that the more widely used AIS is, the greater enterprises' ability to create valuable impacts, challenge competitors to imitate, and create long-term sustainability (Lutfi et al. 2020). From here, we also observe that when using technology or anything new, we see the effect it brings.

According to the findings, the COVID-19 epidemic over the last two years has not only not hampered the effectiveness of AIS, but it has actually had a positive impact. The epidemic broke out during a period of technological development when all activities were carried out via the Internet, and technological applications had the opportunity to promote extremely optimal efficiency, including the effectiveness of AIS; this is consistent with the findings of other studies on the positive impact of COVID-19 on AIS effectiveness, such as (Beland et al. 2020; Spurrk and Straub 2020; Stuerz et al. 2020). The adoption of new technology, such as AIS, is one of the most important success factors (Molino et al. 2020; Scherer et al. 2019). Above all, COVID-19 promotes and upgrades technology and automation infrastructure systems, including AIS infrastructure so that businesses can ensure that employees can use the system securely even when not using enterprise equipment or systems. A more robust system is also a factor in the AIS's Efficacy claim (Nagel 2020).

Finally, a company that implements new technology will help improve the company's operational efficiency. As a result, the study's final result is not surprising and is entirely consistent with the proposed hypothesis. AIS efficiency has a positive impact on business performance. A successful company is one that has earned the trust and satisfaction of its customers. Furthermore, an effective enterprise will be able to manage its employees, which is reflected in employee professional ethics, particularly in the field of accounting, where employee ethics is prioritized. Otherwise, ethical issues will have unpredictability for businesses. The business's performance is reflected in the rate of development, and growth, as well as revenue, profit, market share, and competitiveness (A Ali and AlSondos 2020; Ali et al. 2016; Rozzani and Rahman 2013).

In conclusion, the research findings show that two factors, relative advantage and owner/managers commitment, have a positive influence on AIS usage; the COVID-19 pandemic have a positive impact on AIS effectiveness; and AIS effectiveness has a positive impact on operational efficiency. The systematic influence of technological and organizational factors, as well as the environment's push, makes the Board of Directors feel more secure in applying and expanding AIS to help businesses grow more and more. The study is relevant for businesses in various economies, particularly SMEs, because when these businesses share the characteristic of unstable financial and human resources, they need more motivation for the application of AIS, as well as the accomplishments of the industrial revolution (A Ali and AlSondos 2020; Lutfi et al. 2020; Nastase et al. 2020).

7. Conclusions and Implications

7.1. Conclusions

After a period of research and summary, the results have brought great practical significance. The implementation process proceeds through many stages: from preliminary to detailed. First, we posed a research problem and developed a hypothetical model as well as a preliminary survey. Thanks to the comments of the implementers, we were able to identify many flaws in the actual survey process based on those preliminary results. Then, the questionnaire was completed, and the formal survey began. By using our own relationships, social networking groups, face-to-face interviews at local businesses, and so on, we actively sought out sources of access to office staff and management at all levels of business. Following the collection of sufficient samples, the survey sample is filtered. To test the model, which is based on the TOE model, we used the PLS-SEM method. Finally, a conclusion was reached. Almost all of the proposed hypotheses have an impact on the use of AIS. Furthermore, it has a positive impact on enterprises' decision to use AIS or not. It is undeniable that organizations that have implemented AIS have reaped significant benefits such as time, cost, and labor savings, providing useful information to leadership, and improving professional qualifications. They are almost completely satisfied with the quality that AIS has provided. When survey respondents are willing to continue to use and utilize all resources, as well as encourage employees to work with AIS, it is a good thing for the Vietnamese economy. Furthermore, AIS is demonstrated to be a superior technology capable of managing massive amounts of data. As a result, the use of AIS will become more widespread in the near future. As the COVID situation continues to be complicated, office workers in general and management, accounting, and auditing departments, in particular, are forced to work remotely and cannot communicate directly, while organizations must always maintain and protect data. This is a significant factor in increasing the demand for AIS use.

7.2. Theoretical Contribution

This research has a number of theoretical implications. First, we use the TOE model as the foundation and combine it with the DOI theory to provide greater clarity on the factors influencing AIS demand in our country: specifically, the three factors of technology, organization, and environment. It expands on factors influencing AIS decision making that have received little attention in previous research. The most notable point is to mention

improving the efficiency of AIS, thereby increasing enterprise operational efficiency. As a result, our findings have helped to supplement existing research on AIS and improved users' understanding of the technology.

In the current context, the majority of Vietnamese enterprises have used software to support management in conjunction with the COVID-19 pandemic in recent years, emphasizing the importance of AIS in creating convenience when working from afar. The article adds critical data to the theoretical model, and the novel model serves as a foundation for future research.

7.3. Practical Implications

For practical purposes, we propose some ideas aimed at promoting AIS while also addressing the concerns of businesses considering AIS.

To begin, employees who use AIS must be willing to learn and develop the ability to apply technology in order to meet the needs of the 4.0 era. Technology is becoming more advanced, serving as an effective assistant and shouldering a portion of the workload for employees. The most useful information can be collected, processed, stored, and rendered by AIS. It also aids in the reduction in business and legal risks. Accountants and auditors who use it skillfully will not only maximize the benefits but also save time and effort on manual work that requires less intelligence, allowing them to focus more on decision making and dealing with real-life situations. As a result, when working with equipment and technology, users must first equip themselves with the most fundamental computer knowledge and skills in order to comprehend it. In addition to that, the accounting and auditing team must be highly adaptable due to changes, constant updates with new versions of technology, and uncontrollable epidemiological fluctuations that cause changes in structure and working conditions, it is necessary to understand how to capitalize on opportunities and deal with challenges in order to avoid being obliterated by technological advancement.

Second, in the market economy, competition for each enterprise is becoming increasingly fierce. Thousands of businesses have become bankrupt or been dissolved as a result of the COVID-19 epidemic. To avoid falling behind competitors in the industry, it is necessary to understand how to invest in equipment and technology, including AIS, and train employees through periodic courses, as human resources are always the backbone of an organization. We encourage the use of AIS by focusing on the long-term benefits it brings rather than the short-term costs; the initial investment will be offset by the increased capacity and work efficiency that technology brings. A developed accounting information system will be a decisive factor for the overall smooth and effective operation of the ERP system. At that time, the operating system of the business is enhanced. Managers easily plan and manage their resources and business activities. Senior management must have foresight, recognize the current innovation situation, make the most of AIS, and play a role in reaffirming their market position.

Third, because cost is likely to be a significant barrier to using AIS for small and medium-sized businesses, the government must make efforts to encourage enterprises to use technology in business by using financial support measures and assist in the development of highly qualified human resources. They should also extend cooperation to receive global scientific achievements and create opportunities for large corporations and foreign companies to assist and mentor domestic enterprises.

7.4. Limitations and Future Research

In addition to the new points and practical implications, we are also confronted with some limitations. First, we only discovered two factors influencing the use of AIS (T and O—Technology and Organization), and the E factor mentioned by the GS variable has been eliminated but has not been replaced by variable GS. Another point to consider is that the term AIS is relatively new, and it creates barriers in the process of information communication between the surveyor and the surveyor. Future studies can create annota-

tions and explanations integrated within the survey to increase understanding and make terms easier to understand. The study then sampled all of Vietnam's provinces, but the results were only obtained in Ho Chi Minh City, which is unfortunate given the short time frame. We hope that the approach to the topic will be expanded to other provinces in the coming years through media published on reputable search sources. Finally, more research will contribute to the expanding topic while also being highly practical, providing an opportunity to compare the position of AIS application in organizations across the country and even abroad.

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Appendix A

Table A1. Scale of variables.

Study Measures	Measurement Items
RA Ali et al. (2012)	RA1. Using AIS can reduce our operation cost. RA2. Using AIS can reduce our operation time. RA3. Using AIS can provide useful information to make decisions.
RD Ali et al. (2012)	RD1. We are financially ready to use AIS. RD2. We have enough technological resources to use AIS. RD3. Our employees have adequate knowledge to use AIS.
OMC Lutfi et al. (2020)	OMC1. We consider AIS adoption important. OMC2. We are active engagement in planning and using AIS. OMC3. We support the management shows regarding the deployment and the planning of AIS. OMC4. We are committed to encourage and support the AIS usage by staff. OMC5. We are committed to correctly implement every available resource to use AIS successfully. OMC6. We overcome the hurdles present due to natural resistance to technology usage.
GS Lutfi et al. (2020)	GS1. Government support plays an important role in encouraging and promoting the use of AIS. GS2. Government policies and regulations vary from one industry to another that affect the use of AIS. GS3. Government policies and regulations vary from one country to another that affect the use of AIS.
AISU Lutfi et al. (2020)	AISU1. Information-related needs for reporting dissemination. AISU2. Non-economic information needs, information risk analysis. AISU3. Information needs related to business decisions. AISU4. Ability to respond to information related to business decisions. AISU5. The ability to respond to information related to notification dissemination. AISU6. Ability to respond to analytic risk and non-economic information. AISU7. The ability to reply to informational links to other issues.
AISE Lutfi et al. (2020)	AISE1. AIS is a data collection, storage, recording and processing system to generate information for decision managers. AISE2. Minimize uncertainty in decision making improve the ability to plan and control activities. AISE3. AIS supports SMEs growth in terms of sales, revenue and customers. Provide information to internal and external audiences. AISE4. Improve user satisfaction, reduce errors, and improve information availability. AISE5. Reduce costs, reduce time, save human resources for businesses to use. AISE6. AIS is a connection tool for management systems and operational systems.

Table A1. Cont.

Study Measures	Measurement Items
CV Nagel (2020)	CV1. COVID-19 accelerating digital transformation work-from-anywhere (work from home, no global barrier, work-life balance, flexible work arrangement, time-saving as no commuting needed, ...). CV2. COVID-19 accelerating digital transformation provides benefits of innovative business model (run business remotely, evolution of product, service and processes, online transaction improvement, driving innovative solutions, ...). CV3. COVID-19 accelerating digital transformation provides benefits of technologies, automation and collaboration (telecommuting, virtual workplace, mobility, IT security, the wise use of scrum, ...).
OE A Ali and AlSondos (2020)	OE1. Customer satisfaction. OE2. Employee Ethics. OE3. Enterprise market share. OE4. The growth of sales. OE5. Profits of the business.

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