Causal Factors Affecting the Use of Artificial Intelligence by Accountants in Thailand

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Abstract—The research aimed to study the causal factors affecting using artificial intelligence by accountants in Thailand. The population in the study were accountants, both registered and unregistered with the Department of Business Development and the Federation of Accounting Professions. The research instrument uses a questionnaire distributed to 400 persons as the samples. Data analysis was performed by collaborative component analysis to check the structural integrity consistency examination. Results of causal factors affecting the use of artificial intelligence by accountants in Thailand were consistent with the empirical data, considering the values $x2$/df= 1.743 p= .052 CFI= .998 RMSEA= .052 TLI= .994 RMR= .004; the standard component weights of all variables were positive between .804 - 1.000. The results showed the causal factors affecting the use of artificial intelligence of accountants in Thailand consisted of two aspects, namely personal behaviour, divided into two indicators, namely attitude towards the use of artificial intelligence (AUS) and perceived risk of use (RSR) and information system success, classified into three indicators, namely the utility of information technology (ITU), followed by quality of information systems (QIS), and quality of service (QS). This study benefits executives and accountants as a guideline for changing the working context of personnel, including using as a guideline for self-improvement to keep up with the current situation. It will result in the organization's performance being more efficient and effective in the future.

Keywords- Causal Factors; Artificial Intelligence; Accountants in Thailand

I. INTRODUCTION

Currently, information technology is increasingly associated with the operation and lifestyle of the people. As can be seen during the covid-19 pandemic, it makes all formsof operations require adaption. It is initially operated through public relations to consumers. It is adapted to the use of technology to communicate with consumers. In addition, the introduction of receipt and payment through online systems. Besides, ordering, selling products, searching for raw materials via online networking. CAT cyfernce [1] found that the new normal is increasingly adopting information technology in business or using it to replace human labour. Some technologies are supported by the government, private, or businesses, by developing technologies to assist the operation, especially the technology that supports artificial intelligence (AI). It is a branch of computer science related to computer programming, which is in a problem-solving process described as a precise procedure, in technical called algorithms by the format that appears to be in three characteristics. Including communication characteristics (natural language), characteristics described by simulated codes or pseudo codes that have been defined from the beginning (pseudocode), and characteristics represented by flowcharts. Malisuwan [2] and Rattanapoka [3] found that artificial intelligence is another way to develop computers, which allow computers to think and make decisions close to humans. Based on the study of thinking principles, decisions or human reasoning principles, for use to develop the potential of a computer to respond to the tasks more than just mechanical or conventional programs. The idea was implemented as a step for the computer to work to fix the problem, solve, and learn by itself. As a result, computers are more intelligent. It can work effectively in complex systems without human labour.

At the same time, businesses are now increasingly adopting technologies that support artificial intelligence—especially accounting, which is a job related to documents, which are large amounts. Therefore, accountants need to select documents to record trade transactions and prepare financial statements to present their operations to executives. Sometimes, the procedure is not on time for use or on time but with errors. It results in detriment to the business. The adoption of artificial intelligence into the company is, therefore, an instrument to assist the operations of accountants. As can be seen from the IRS, moving to online tax payments and online receipts are issued. The Department of Business Development delivers financial statements through the E-filling system, online juristic person registration, and the preparation of the Tax Audit System of the Revenue

Department [4]. In addition, accounting package software programs have been developed to work with artificial intelligence, such as QuickBooks Xero Sage developed artificial intelligence to assist with accounting codes, record accounts and reconcile bank account transactions, and automatically create tax forms. Artificial intelligence systems can learn and improve their working patterns in machine learning [5]. Therefore, the use of OCR technology changes the role of accountants to be the one who validates and confirms the accounting [6].

As a result, the researchers aim to study the causal factors that affect using artificial intelligence by accountants in Thailand in order to provide a direction to implement information technology that effectively supports artificial intelligence, resulting in business, management, and accountants receiving accurate information. Also, It can be used in business planning to compete with other companies or industries and helps Thai accountants to comply with applying artificial intelligence in accounting applications. This results in accurate, fast, timely accounting work and insights to bring in operational forecasts that will benefit businesses and service users in the future.

II. Literature Review and Hypothesis

The artificial intelligence to carry out accountants' tasks is new and requires accountants to change their ideas or behaviour to reflect current changes. In addition, the choice of artificial intelligence is necessary to consider various issues to comply with business and operations, as the study of Nutkanjanakul [7]. It found that the accounting practitioners in six aspects will give importance to the use of artificial intelligence to assist them in operating with the risk of data theft and facilitation. Guroong [8] found that risk management, application for use in analyzing and providing services to customers, are associated with the acceptance and use of artificial intelligence. Wongprathet [9] found that the accounting office's readiness to use artificial intelligence to perform the work of accountants is concerned with attitude, security, and ease of use. By the way, a person's behaviour, the theory of success in information systems, is the theory concept used to determine artificial intelligence, includes system quality, service quality, and utility of artificial intelligence. DeLone & McLean [10] mentioned that the success of the information system consists of system quality, information quality and service quality. Similar to Thanasakorn [11], factors correlated with the impact of artificial intelligence on financial services include the quality of service, attitude, and behaviour factors. It is consistent with the study of Akarasuwan [12] which that the quality component of information systems and service quality was the component that resulted in the success of accounting information systems in government organizations. Hussein, Selamat, & Abdul [13] found factors correlated with success in using electronic government in a stable of essential factors including the performance of information systems, the utilization of information systems, the linkage of information systems, and the structures that support the information system, which are factors used to measure the quality of information systems, information quality, benefits and satisfaction. Kim et al. [14] found that the quality factors of information systems for nursing were the most satisfied and increased when good service was available. According to the relevant review, it is possible to make assumptions:

H1: The causal factors in individual behaviour that result in the use of artificial intelligence by accountants in Thailand consist of two indicative variables: attitude towards artificial intelligence and system risk perception.

H2: The causal factors for the success of information technology systems affecting the use of artificial intelligence of accountants in Thailand consist of three indicative variables: the utility of information technology, the quality of information systems, and the quality of services.

III. Methodology

A. *Purpose of the study*

To study the causal factors that affect the use of artificial intelligence of accountants in Thailand

B. *Conceptual Framework*

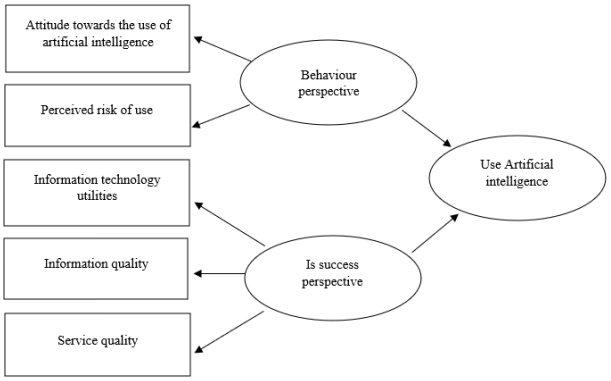

Figure 1. Conceptual Framework

C. *Scope of the Study*

The study was quantitative research. The population were accountants in Thailand, neither registered nor registered with the Department of Business Development and the Federation of Accounting Professions. The exact population were unknown; the population has been used according to Taro Yamane's formula at a confidence level of 95 per cent or 0.05, with a population of more than 100,000. The samples were accountants in Thailand who are both registered and not registered with the Department of Business Development and the Federation of Accounting Professions under the Royal Patronage. A

total of 400 people used the questionnaire as an instrument to collect data through Google Form. After receiving the response, (then the data were validated before analysis). Next, the analysis of data with the statistical package program was divided into two groups: descriptive statistics in the personal data section, presented in percentage, and Inferential Statistics. The researcher tested the hypotheses by studying Exploratory Elements. To identify the number of elements by synthetic methods and use the analysis results to build the causal factor model that affects the use of artificial intelligence by accountants in Thailand. Then, analyse the affirmative element. To analyse the structure of observation variables in each component to determine the harmoniousness of the causal factors model affecting the use of artificial intelligence of accountants in Thailand, Statistics used were shown in Table 1.

Table 1 Statistics to determine the harmony of models with empirical data

GOF Test	Name	Cut-off Value	Reference
x^2/df	Normed Chi-square	<3	Carmines & Mclver [15]
P	Probability Value	≥ .05	Ullman [16]
CFI	Comparative fit index	> .95	Carlson & Mulaik [17]
RMSEA	Root mean square error of approximation	< .06	Yu [18]
TLI	Tucker-Lewis index	> .95	Hu & Bentler [19]; Hair et al., [20]
SRMR	Standardised root mean square residual	< .08	Hu & Bentler [19]; Byrne [21]

IV. FINDINGS

Demographic data

It showed that most Thai accountants were female (68.90%), age between 21 and 30 years (72.50%), Education level is Bachelor's degree (62.90%), and experienced in accounting for 1-3 years (31.40%).

Table 2 Correlation Metrics of Causal Factors Affecting the Use of Artificial Intelligence of Accountants in Thailand

Variables	AUS	RSR	ITU	QIS	SQ
AUS	1				
RSR	.737***	1			
ITU	.796***	.696***	1		
QIS	.794***	.700***	.850***	1	
SQ	.743***	.649***	.852***	.819***	1

From Table 2, the relationships among causal factors affecting the use of artificial intelligence by accountants in Thailand, such as the attitude towards the use of artificial intelligence (AUS), the perceived risk of use (RSR), the utility of information technology (ITU), Information System Quality (QIS) and Service Quality (SQ) were of a high level between .649 - .852, with a positive correlation.

Table 3 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.967
Bartlett's Test of Sphericity	Approx. Chi-Square	12586.137
	df	990
	Sig	.000

From Table 3, KMO statistics and Bartlett's of Sphericity statistics were used to determine data suitability in the composition analysis techniques. The KMO value was .967, so it is appropriate to analyse the composition [20]. When examined from Bartlett's Test of Sphericity, which tested the hypothesis as follows. H0: Correlation matrix is an Identity matrix or variables are not related, and H1: Correlation matrix is not an identity matrix or variables are related. The test statistics had a significant at .001, which is less than .05. So rejected H0, variables are related and appropriate to analyse the element.

Table 4 Statistical analysis of model harmony test

Index	Criteria	Harmony Test Results			
		Before		After	
		Index	Interpretation	Index	Interpretation
x^2/df	<3	5.590	Not pass	1.743	Pass
p	≥ .05	.000	Not pass	.137	Pass
CFI	> .95	.983	Pass	.998	Pass
RMSEA	< .06	.128	Not pass	.052	Pass
TLI	> .95	.965	Pass	.994	Pass
RMR	< .08	.009	Pass	.004	Pass

From Table 4, the results of the analysis of causal factors affecting the use of artificial intelligence by accountants in Thailand were initially inconsistent with empirical data. The researchers then adjusted the element model using the technique of welding the double-headed arrow between the tolerances of variables with modification indices (MI) values. Suggesting adjustment based on relative chi-squares (x2/df), Statistical significance level (p), Comparative harmony level index (CFI), quadrille root value of estimated tolerance, the Comparative Conformity Index (TLI), and the root value of the squared average of the remnants in standard score form (RMR). After adjusting the model, the composition was consistent with the empirical data in a good criterion.

Table 5 Results of Analysis of Causal Factors Affecting the Use of Artificial Intelligence of Accountants in Thailand

Latent Variables	Behavior			Success_IT			r^2
Observable Variables	βi	b	S.E.	βi	b	S.E.	
RSR	.804*	1.000	-				.647
AUS	.917*	.834	.057				.841
SQ				.898*	1.000	-	.806
ITU				.938*	.938	.036	.880
QIS				.914*	.928	.039	.836

Variables	Use Artificial intelligence				X^2 =6.973 df= 4 p= .137 CMIN/DF= 1.743 TLI= .994 GFI= .998 RMR= .004 RMSEA= .052
	βi	b	S.E.	R^2	
Behavior	1.000*	1.000	-	1.000	
Success_IT	.926*	.834	.053	.858	

From Table 5, the results of the analysis of causal factors affecting the use of artificial intelligence of accountants in Thailand found that every variable had a statistically significance at level .001. It is indicated that all variables have reliability and meaningfully descriptive composition weight. When considering the variables in each element, it showed that both behavioural elements had a standard composition weight between .804-.917. The accuracy value (r2) between .647-.841, with the attitude variable towards using artificial intelligence (AUS), had the highest standard element weight. The success components of the information system, in all variables, weigh a standard composition between .898-.938. The accuracy (r2) between .806-.880 is valued by the Information Technology Utility Variable (ITU), which weighs the highest standard elements, and considering the main elements: personal behaviour and information system success, all elements were found to have a significance level of .001. The standard composition weight between .926-1.000 had a precision (R2) between .858-1.000.

V. CONCLUSION

The results of the study can be summarised as follows.

1. Results of the analysis of causal factors affecting the use of artificial intelligence by accountants in Thailand found that the models created by the researchers were consistent with empirical data. Based on established research assumptions, which showed that causal factors contributed to the use of artificial intelligence by accountants in Thailand, there are two elements, five variables. First Element 1: Human behaviour, there are two variables such as attitudes towards the use of artificial intelligence (AUS) and systemic risk perception (RSR), and Element 2: Information System Success, there are three variables such as the utility of information technology (ITU), the quality of information systems (QIS) and service quality (SQ). Such elements and variables have a reliable level of standard composition weight and can be described us significantly at the .001 level. It was in line with the study of Namachote & Mahoran [22] that the performance expectation, ease of use, social influences, and usage facilities affect the adoption of cloud computing technology. In addition, Sanitchon [23] found that six factors influence the decision to use food delivery applications, including advertising, public relations, promotions, awareness of benefits, perceived ease of use, and attitude, are consistent with empirical information. Sriboonma, Punthong, & Chutimantapong [24] found that the acceptance and use of technology influenced the decision to pay with QR codes of tourists using mid-sized hotels in Chiang Mai. There are five factors, including the social influence, the confidence of the system user, the attitude towards the use of the system, the availability of support equipment, and the expectations of efficiency.

2. The individual behaviour factor found that the attitude variable towards using artificial intelligence had component weighs at the highest standard. Because individual behaviour is an essential variable in adopting technologies, including artificial intelligence, current technologies will assist in raising operational efficiency. Therefore, they affect the needs of individuals, significantly changing accountants. It was similar to the study of Nathapradit [25] that personal factor contributes to the electronic paper system acceptance of the cooperative auditor's. Meanwhile, Khiewratana [26] found that the individual behaviour and social influence affect the decision to use QR Code service via the smartphone of customers of Bangkok Bank Public Company Limited in Hat Yai District, Songkhla Province. It was consistent with the study of Sansai & Surachaikulwatana [27] that individual behavioural factors are reflected in the unfavourable to technology. It is a factor that conducts to the adoption of technology in the application of intelligent audit systems for the operation of the Bank. Also Chitraua et al. [28] found that the benefits, usage patterns, ease of use, influenced the efficiency of hospital services. It was in line with Charles [29] that good attitudes affect the intention to use technology through mobile of students in the university.

3. The success factor of the information system revealed that the variable utility of information technology (ITU) weighed the highest common factor because the utility of information technology would mean convenience, ease of use, cost and time-saving, and perceived the benefits of using artificial intelligence in operations. It was in line with the study of Wangyen [30] that easy to use and the perception of the benefits of technology will affect the acceptance of the use of technology for process accounting data of the Federation of Thai Industries. It was similar to the study of Thongchai [31]; the customer perspective, cost perspective, convenience perspective, and communication channel perspective were essential factors in adopting technology in restaurant reservations

through mobile applications. At the same time, Kittikunsiri [32] studied factors that affect the adoption of artificial intelligence chatbot technology in the Thailand Context and found that factors affecting the adoption of artificial intelligence chatbot technology include media performance, technology compatibility, ease of use, perception of benefits and risk perception. Meanwhile, the study of Teo [33] showed that the perceived benefits, the perception of ease of use, the condition of facilitation, and attitude towards use influenced the need to use technology by the instructor. It was in line with Charles [29] that the perception of utility and attitudes affects the mobile willingness of students in the university.

VI. RECOMMENDATIONS

A. Recommendations for Practitioners

All factors are essential for using artificial intelligence of Thai accountants, especially in individual behaviour, which is the most critical aspect. The second importance is the success of information systems. The study results can be used as a model for modernising accounting organisations by utilising information technology and conclude in accounting or other businesses. In addition, the models can be used to develop people to prompt them to adopt modern technology in business. Therefore, executives, business operators, or even accountants should focus on such variables that appear in the study results for analysis before applying technologies to their organizations or agencies to ensure efficient and effective investment in information technology.

B. Recommendations for Further Study

The further research should be conducted on comparing or finding relationships or factors related to information technology, such as theory of acceptance and use of technology (UTAUT), technology framework theory, organization and environment (TOE) other variables related to the adoption of information technology and those interested in the success of the implementation of information technology in businesses can apply such factors and variables to study relationships or differences or apply information technology in companies with performance. It may compare with each type of technologie that occur today, such as blockchain and the Internet of things, to provide the result of implementing systems in their business.

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