

Guidelines for using Information Technology in Accounting to Maximize the Efficiency of Organizations in the Industrial Business Sector

Bongkoch Kamolprem¹, Pannarai Lata², Thanin Silpcharu³

Abstract

This research aims to study the approach of using information technology in accounting for the maximum efficiency of organizations in the industrial business sector and to develop it into a structural equation model. The qualitative research used in-depth interviews and group discussions for model validation. For the quantitative research, a survey was conducted with executives in the accounting sector of the industrial business, totaling 500 entities. The statistical values used include descriptive statistics, inferential statistics, and multivariate statistics. The research findings indicate that the approach to using information technology in accounting for the maximum efficiency of organizations in the industrial business sector comprises five aspects as follows: 1) Strategic Analysis ($X^{\bar{}} = 4.32$) 2) Risk Management ($X^{\bar{}} = 4.31$) 3) Forecasting ($X^{\bar{}} = 4.25$) 4) Business Intelligence ($X^{\bar{}} = 4.17$) And 5) Information Generation ($X^{\bar{}} = 4.12$) The hypothesis testing results revealed that medium-sized and small businesses differ significantly from large businesses. The analysis of the developed structural equation model showed that it meets the evaluation criteria. It is consistent and coherent with empirical data, with the probability value of Chi-square, the relative Chi-square value, the goodness-of-fit index, and the root mean square error of approximation being 0.057, 1.140, 0.954, and 0.017, respectively.

Keywords: *Information Technology, Accounting, Strategic Analysis, Risk Management, Forecasting, Business Intelligence, Information Generation.*

Introduction

Twenty-Year National Strategy Plan (A.D.2018-2037) is Thailand's first national strategy as outlined in the Constitution of the Kingdom of Thailand. It is designed to guide the country towards the realization of its vision through practical implementation. Thailand is stable, prosperous, and sustainable. Progressing towards a developed country. From the national strategy on building competitiveness in digital industries and services, data, and artificial intelligence. The use of digital technology, data, and artificial intelligence to enhance the potential and competitiveness of industries and services. Encompassing automation systems, robotics, smart electronics, and the Internet of Things in everything to elevate the efficiency of the entire Thai economy. The creation of a platform for the

¹ King Mongkut's University of Technology North Bangkok, bongkoch.pnu@gmail.com

² King Mongkut's University of Technology North Bangkok, pannarai.l@fba.kmutnb.ac.th

³ King Mongkut's University of Technology North Bangkok, thanin.s@fba.kmutnb.ac.th

future economy to enhance the quality of life for the population by establishing digital services, data, and artificial intelligence industries as drivers of Thailand's transformation into a developed nation through innovation and future technologies. (NESDC, 2018)

Thailand's Digital Government Development Plan for the years 2023-2027 aims to elevate the Thai public sector towards the goal of providing services that meet the needs of the people and reduce inequality, as well as to enhance the capability and competitiveness of the business sector. In 2022, Thailand's ranking in digital competitiveness dropped from 38th to 40th, a result of a decline in the factors of knowledge and future readiness. Thailand still needs to develop in terms of knowledge and future readiness. The country's ranking in the readiness index for the development of information and communication technology has decreased. Thailand's weaknesses in digital development lie in areas related to internet usage among its population and the security of internet servers, which are still limited in proportion and number compared to other countries, especially those that are leaders in this field. (Electronic Transactions Development Agency, 2022)

Today, accounting professionals are facing a tremendous wave of change (Disruptions), originating from technological advancements since the advent of the internet. Such changes have impacted accountants, necessitating continuous adaptation and development to keep pace with these shifts. For accounting professionals to adapt effectively, they must understand the trends in evolving technology. (Theerachai, 2019) In the digital era, accountants have evolved from being financial managers of companies to leaders driving organizational strategic plans. They lead in managing the transformation of organizational work culture by incorporating new technologies and innovations into operations. They are capable of managing and analyzing business data in real-time. The information system that best responds to the operational needs of the industrial business sector is the Enterprise Resource Planning (ERP) system. This system can integrate all data and processes occurring within an organization, enabling them to work together as a single, highly flexible, and efficient system, which is globally recognized today. The Department of Business Development has mandated that registered legal entities are obligated to submit their financial statements to the Department of Business Development annually, regardless of whether they are currently operating or not. Those responsible for accounting are required to submit financial statements in accordance with the Accounting Act, B.E. 2543 (2000), the Commercial Association Act, B.E. 2509 (1966), and the Chamber of Commerce Act, B.E. 2509 (1966). However, some legal entities still submit their financial statements late. Despite a decreasing trend, a significant number continue to delay their financial statement submissions. This is illustrated in Table 1-5.

Table 1 Number of Legal Entities Submitting Late Financial Statements, Years 2017–2021

Year	2017	2018	2019	2020	2021
Number (cases)	45,286	42,905	54,929	38,435	38,428

Source: Business Data Division, Department of Business Development (2022)

The integration of digital technology to enhance efficiency, from production to sales, develops competitiveness, reduces costs, and adds value to products and services, thereby creating added value to the overall GDP of the country. Indeed, it can be called the era of the Digital Economy. Currently, digital technology plays an increasingly significant role in accounting, with various tools such as Robotic Process Automation (RPA), Blockchain, Optical Character Recognition (OCR), Workflow, and Software Applications being utilized to enhance efficiency and accuracy in accounting processes. Being used to reduce errors, lower operational costs, and increase efficiency and effectiveness in accounting processes. All of these factors require accountants to step out of their comfort zones and

acquire new skills to expand their roles in supporting, creating value, and using data and various tools for analysis to help organizations make informed decisions and drive organizational strategies. (Thailand Federation of Accounting Professions, 2021)

Therefore, utilizing information technology in accounting to enhance accuracy and efficiency while leveraging its benefits contributes to competitiveness and the enhancement of capabilities. Working collaboratively with information technology systems presents opportunities for accountants to provide accounting services in new ways. In the present, technology is constantly changing, requiring accountants in the digital era to adapt and expand their roles. They need to enhance their skills, business analysis capabilities, and collaborate closely with business owners to effectively respond to the evolving business environment.

Research objectives

- 1) To study the structure and operational characteristics of the industrial business.
- 2) To investigate the components of the guidelines for implementing information technology in accounting for maximum efficiency in organizations within the industrial sector.
- 3) To develop a structural equation model for the implementation of information technology in accounting to maximize efficiency in organizations within the industrial sector.

Literature Review

Strategic Analysis

Mintzberg (1989) developed the concept of strategy development based on the 5 P framework, suggesting that these perspectives should be considered in the formulation and adaptation of strategies. The 5 perspectives include: 1) Strategy must have a Plan, 2) Strategy must involve a Ploy, 3) Strategy must have a Pattern, 4) Strategy must have a Position, and 5) Strategy must have a Perspective. David (2022) stated that the process of strategizing, both internally and externally, should guide the practical implementation of strategies to achieve the organization's objectives and mission. Rudnicki and Vagner (2014) mentioned that strategy analysis is the initial step in strategic management. Strategy analysis typically encompasses key activities such as defining the Vision, Mission, Goals, Objectives, Targets, and organizational policies, depending on the choices made by each organization. Managers should be able to clearly define what strategy analysis should accomplish, what can be done, and what needs to be done. Strategy analysis includes an examination of the external environment as well as an analysis of the internal environment. (Kotlor 2003, Trigo and Estebanez 2014)

Risk Management

Cupic (2015) The factors that pose risks that may hinder organizational management to achieve competitive advantage may not go as expected in terms of time, budget, and objectives. According to Bannerman (2008), risk management involves setting principles and practices with the aim of identifying, analyzing, and managing risk factors to increase opportunities to achieve goals and avoid errors in business. Decision-makers at various levels must contend with the risks that arise and the severe consequences of erroneous decisions. Therefore, decision-makers need to assess the risks. Decision-making occurs in uncertain situations that may lead to erroneous decisions and potentially irreparable harm. Managers should consider options for risk management and develop risk management strategies or action plans. Managing risks involves maintaining risks at acceptable levels and within the organization's risk tolerance. (The Institute of Internal Auditors of Thailand, 2009)

Forecasting

Trigo, Belfo and Estebanez (2014) Forecasting is the process of making predictions or projections about future events or conditions. Kotlor (2003) Forecasting involves estimating or predicting future events or conditions, such as predicting the demand for products or services or forecasting future labour force needs. In business decision-making, forecasting is often related to evaluating the outcomes associated with different choices in order to make informed decisions. It helps organizations plan for the future, allocate resources effectively, and make strategic decisions based on the expected outcomes of various options. (Thivakaran and Ramesh, 2022) "Organizations need to be able to forecast demand accurately in order to plan." Atchara (2014) Accurate forecasting or predicting the future is beneficial for business planning. The necessary reasons or advantages of business forecasting are as follows: 1) It allows for the appropriate allocation of resources. 2) It enhances operational efficiency within the business. 3) It enables responsiveness to customer needs. 4) It increases profits and returns for the business. 5) It reduces various losses. 6) It improves coordination among different departments within the organization. Forecasting is most accurate under stable environmental conditions, and the more the environment changes, the greater the uncertainty, leading to less accuracy in forecasting.

Business Intelligence

Gartner (2015) Smart business systems are the most popular tool adopted by many organizations to assist managers in making well-informed decisions. They collect and filter data, organize it into information systems, and can display results that change the perspective of the data to be used effectively and efficiently in the organization's operations. Ghosh, Haider, and Sen (2015) The development of a smart business system relies on a data repository tailored to specific functions. The data of interest includes historical transaction records and current transaction data, which may come from various sources and utilize data integration techniques to manage the data consistently. Tohir, Kusri and Sudarmawan (2017) The process of integrating data and storing it in a unified database enhances the efficiency of using data for online analytical processing and data warehousing. Technology can be leveraged to streamline operations and improve the accuracy, speed, and precision of various tasks.

Information Generation

Cushing and Rommey (1994) The information is some or all of the truth that is collected, stored, and processed by the creation of information, which will be data that has been collected and processed to support the management and decision-making of executives. Zwass (1992) The process of information management involves systematically organizing data, starting from data collection, data processing, and utilizing data in various relevant tasks, including organizational management, to ensure efficient operational practices. Sananwatananont, W., Techakana, J., & Silpcharu, T. (2022) Data is a valuable asset to an organization because it takes the organization's resources to obtain, so it is extremely important to maintain and prevent the possibility of snatching outside the organization. In addition to maintaining data in an organization, data is only useful when it is modernized and can be used to formulate a business strategy known as "Data Driven Strategy" Senangkanikorn N., Khumlaitong, N., Thongnium, W., & Ingadapa, N. (2020)., which produces more efficiency than using the intuition and experience of the planner.

Research Methodology

"This research is a Mixed-Methodology Research consisting of 3 stages as are as follows:

Stage 1: Qualitative research using in-depth interview techniques. The researcher conducted interviews with 9 experts to gather qualitative data. The results of these

interviews were then summarized and transformed into a questionnaire. There were three expert groups involved: a group of 3 organizational managers, a group of 3 government agency representatives, and a group of 3 academic experts. (Leepaitoon, Lata, & Worawattanaparinya, 2020)

Stage 2: Quantitative Research using survey techniques with questionnaires that have passed the IOC (Item-Objective Congruence) criteria from 5 experts. The researcher then conducts a Try-Out with 30 individuals to analyze the Discrimination value. Subsequently, the tool is used to collect data by requesting the sample group to complete the questionnaires. Data from 500 complete samples are analyzed for statistical processing and to develop a structural equation model. The criteria used for assessing the model fit (Evaluating the Data-Model Fit) include 4 values: 1) Chi-square probability value >0.05 , 2) Relative Chi-square value <2.00 , 3) Goodness-of-fit index >0.90 , and 4) Root mean square error of approximation <0.08 . (Thanin Silpcharu, 2020) Stage 3 of the research involves qualitative research using group interview techniques with 11 qualified individuals from the business sector. This step was aimed at gathering recommendations through a purposive sampling method, as specified by Lata (2020). The selected recommendations were then used to validate the structural equation model.

Results

The statistical analysis results of the Guidelines for using information technology in accounting to maximize the efficiency of organizations in the industrial business sector

Table 1 Overall means and standard deviations of importance levels of the Guidelines for using information technology in accounting to maximize the efficiency of organizations in the industrial business sector

The components of 'Guidelines for using information technology in accounting to maximize the efficiency of organizations in the industrial business sector	\bar{X}	S.D.	Importance levels
Overall	4.23	0.41	high
1. Strategic Analysis	4.32	0.37	high
2. Risk Management	4.31	0.38	high
3. Forecasting	4.25	0.45	high
4. Business Intelligence	4.17	0.50	high
5. Information Generation	4.12	0.52	high

Table 1 The analysis of the level of importance of the components of guidelines for using information technology in accounting to maximize organizational efficiency in the industrial business sector revealed that, overall, they are highly important with an average score of 4.23. When analyzing the importance level for each component, it was found that every aspect is highly important and can be ranked in descending order as follows:

- 1) Strategic Analysis ($\bar{X} = 4.32$): The most crucial sub-items include the preparation of budgets from information and the comparison of actual work performance with budgets.
- 2) Risk Management ($\bar{X} = 4.31$): The most critical sub-items are having a control system that restricts access to information and resources only to authorized personnel.
- 3) Forecasting ($\bar{X} = 4.25$): The most important sub-items are using information to accurately and comprehensively measure the value of transactions and having highly accurate forecasting that closely matches actual occurrences.

4) Business Intelligence ($\bar{X} = 4.17$): The most significant sub-items include using stored data in the data warehouse to support planning, decision-making, and management by executives.

5) Information Generation ($\bar{X} = 4.12$): The most important sub-items are efficiently presenting financial reports of the business and providing economically beneficial economic data that supports the decisions of financial users.

Table 2. Statistical statistics for assessing the goodness-of-fit of the structural equation model before and after model modification

Statistical values	Consideration criteria	before modification	after modification
1. CMIN-p	> 0.05	0.000	0.057
2. CMIN/DF	< 2	1.223	1.140
3. GFI	> 0.90	0.457	0.954
4. RMSEA	< 0.08	0.068	0.017

Table 2 The statistical values assessing the goodness of fit of the structural equation model before modification indicate that The Chi-Square Degrees of Freedom Ratio (CMIN/DF) = 1.223 and the Root Mean Square Error of Approximation (RMSEA) = 0.068. These values meet the criteria for goodness of fit assessment with observed data. The Chi-Square Probability Level = 0.000 and the Goodness of Fit Index (GFI) = 0.457 did not meet the criteria for goodness of fit assessment with observed data. Therefore, the researchers proceeded to make modifications to the model. After the model modifications were completed, it was found that the (Chi-Square Probability Level) = 0.057, which is greater than 0.05. The Chi-Square Degrees of Freedom Ratio (CMIN/DF) = 1.140, which is less than 2. The Goodness of Fit Index (GFI) = 0.954, which is greater than 0.90, and the Root Mean Square Error of Approximation (RMSEA) = 0.017, which is less than 0.08. Therefore, it can be concluded that all four statistical criteria passed the goodness of fit assessment. The structural equation model for the guidelines for using information technology in accounting to maximize the efficiency of organizations in the industrial business sector, after the modifications, is now consistent with the empirical data.

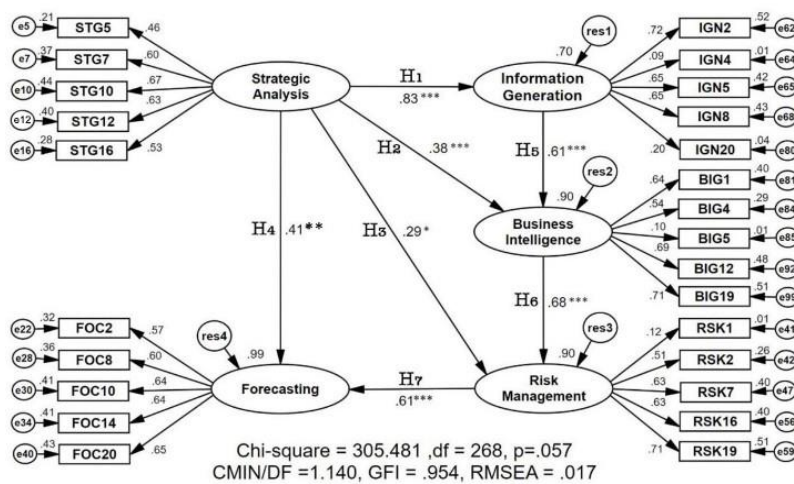


Figure 1 A structural equation model for guidelines on using information technology in accounting, aimed at maximizing organizational efficiency in the industrial business sector, in standardized estimate mode after model modification.

The hypothesis testing results for analyzing causal influences among latent variables in the guidelines on using information technology in accounting, aimed at maximizing organizational efficiency in the industrial business sector with 7 hypotheses found that

H1 : Strategic Analysis directly influences Information Generation. With statistical significance at the 0.001 level and a Standardized Regression Weight of 0.83, in accordance with the established research hypothesis.

H2 : Strategic Analysis directly influences Business Intelligence With statistical significance at the 0.001 level and a Standardized Regression Weight of 0.38 , in accordance with the established research hypothesis.

H3 : Strategic Analysis directly influences Risk Management. With statistical significance at the 0.05 level and a Standardized Regression Weight of 0.29 , in accordance with the established research hypothesis.

H4 : Strategic Analysis directly influences Forecasting With statistical significance at the 0.05 level and a Standardized Regression Weight of 0.41 , in accordance with the established research hypothesis.

H5 : Information Generation directly influences Business Intelligence. With statistical significance at the 0.001 level and a Standardized Regression Weight of 0.61, in accordance with the established research hypothesis.

H6 : Business Intelligence directly influences Risk Management With statistical significance at the 0.001 level and a Standardized Regression Weight of 0.68, in accordance with the established research hypothesis.

H7 : Risk Management directly influences Forecasting With statistical significance at the 0.001 level and a Standardized Regression Weight of 0.61, in accordance with the established research.

Discussion and Conclusion

1. From the research results, when comparing the components of guidelines on using information technology in accounting, aimed at maximizing organizational efficiency in the industrial business sector, between large industrial businesses and medium and small-sized industrial businesses, it was found that there are statistically significant differences at the 0.05 level. Specifically, large industrial businesses generally have an advantage because they prioritize objectives related to risk management. These include objectives related to operational practices, strategic objectives, reporting objectives which account for 23.20%, and objectives related to regulatory compliance, which align with the research of Brunner et al. (2020) He found that the purpose of data security management is to ensure that the value of data and data processing systems are appropriately protected. Data security risk management techniques are integrated to deal with threats and vulnerabilities that pose risks to the security characteristics of the data. And is consistent with the research of Jakka (2022) He was found that with increased investment in technologies related to machine learning and artificial intelligence, IT businesses or companies can effectively reduce the risk of cyber-attacks.

2. From the hypothesis testing results, it was found that the component of Strategic Analysis has the highest overall influence on the component of Forecasting, with the highest overall influence, having a Standardized Regression Weight of 0.96. This demonstrates empirical evidence that organizations using software to monitor and compare actual figures with budget estimates for operational improvements can analyze weaknesses and strengths of each product type using this information. This is done to plan in accordance with customer needs. The use of data analysis software to analyze the relationships between cost, volume, profit, breakeven points, and the use of information in planning budgets for both the present and future of the company is significant. Budgets are prepared from this information, and actual

performance is measured and compared with the budget. There is a system for collecting retrospective data from both internal and external sources to aid in decision-making for improvements. Thivakaran and Ramesh (2022) state that organizations must be able to forecast demand accurately in order to plan. Sales forecasting should align with projected sales scenarios in order to adjust business strategies to match the anticipated performance. Jawadi et al. (2022) found that economic indicators are highly useful in forecasting financial situations and there is a significant relationship between financial and economic cycles, which strengthens during the 'expansion - growth' phases. This result helps investors and decision-makers better forecast future movements in the financial sector using data from actual business cycle analysis.

3. From the hypothesis testing results, it was found that the component of Strategic Analysis exerts the highest direct influence on the Forecasting component, with a Standardized Regression Weight of 0.41. This demonstrates empirical evidence that organizations prioritizing strategic analysis can accurately forecast business events. Rudnicki and Vagner (2014) states that strategic analysis is the initial process of strategic management, which includes essential activities such as defining the Vision, Mission, Goal, and/or Objective Target, and Organization Policy as chosen by each organization. This is consistent with the Sroginis et al. (2022), which states that even though statistical forecasting has improved, human judgment remains the foundation of business forecasting and demand planning.

Suggestions

1. Policy-level suggestions derived from the research.

- 1) The Electronic Transactions Development Agency (ETDA), The Ministry of Digital Economy and Society, should promote projects with an appropriate ecosystem for electronic transactions as a key tool in creating opportunities, sustainability, and competitive advantage for Thai entrepreneurs.
- 2) The Department of Business Development, Ministry of Commerce, should expedite the promotion and development of accounting professionals and accounting firms to use modern technology and keep pace with the changing business models.
- 3) Thailand Federation of Accounting Professions should accelerate the development of technological skills for accountants to support the changes in business models and organize training courses on technology skills applicable in accounting for university professors to stay abreast of these changes

2. Operational-level suggestions derived from the research.

- 1) The industrial business sector should prioritize the use of quantitative information to study the feasibility of high-value projects before making investment decisions. This is because using technology to analyze accounting information for evaluating alternatives and making decisions before investment and addressing both short-term and long-term managerial problems will lead to more accurate decision-making.
- 2) The industrial business sector should use accounting software to forecast financial status and business performance. Forecasting future operational outcomes will benefit financial analysts by helping to determine strategic planning approaches.
- 3) The industrial business sector should utilize the artificial intelligence (AI) systems in accounting to ensure convenience, accuracy, and speed, thereby increasing efficiency.

Suggestions for future studies

It is essential to focus on the study of the gaps that occur between the public sector, education, and the private sector to create a process of awareness-building across all sectors. This will facilitate the more efficient utilization of information technology in accounting. Emphasizing the integration of information technology will enhance competitiveness and future research. Therefore, it is crucial to study the 'Guidelines for Developing Digital Accountants to Enhance Competitiveness'.

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