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AND ECONOMICS  
REVIEW**

**FACULTY OF BUSINESS ADMINISTRATION #RTBS**

**RAJAMANGALA OF TECHNOLOGY THANYABURI**



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## Objectives of the Journal

1. To serve as a platform for disseminating academic work in business administration and economics to scholars and interested individuals from both the public and private sectors. The knowledge presented may be referenced and applied by individuals and organizations at national and international levels.

2. To act as a medium for the exchange of knowledge in the fields of business administration and economics, including theories, modern business concepts, research methodologies, applied knowledge, and experiences among faculty members, academics, researchers, executives, businesspersons, students, and the public, all contributing to national development.

3. To enhance the academic potential of the Faculty of Business Administration, Rajamangala University of Technology Thanyaburi (RMUTT), by publishing research conducted by faculty and graduate students, as well as by providing a platform for creative and impactful research that addresses the needs of entrepreneurs in business and industry.

4. To elevate RMUTT's recognition in the academic and research communities through the publication and dissemination of high-standard academic work that meets international standards.

## Scope of the Journal

This journal is classified as a scholarly journal in the field of social sciences and humanities, with a specific focus on various disciplines in business administration. Submitted articles must meet academic standards and contribute to knowledge creation or its application in a broad context relevant to both the public and private sectors. The RMUTT Global Business and Economics Review (GBER), Faculty of Business Administration, Rajamangala University of Technology Thanyaburi, welcomes articles in the following areas:

1. Accounting, Finance and Banking, Taxation, Auditing, and Internal Control
2. General Management, Human Resource Management, Human Resource Development, Industrial Psychology, Public Management, Public and Private Sector Management, Engineering Management, Industrial Management, International Business Management, Supply Chain and Logistics Management
3. Marketing, Service Marketing, International Marketing, Modern Marketing
4. Economics, Business Economics, International Economics
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# Review Process

Articles are required to be submitted in English only and are subject to a rigorous academic review process involving both the editorial board and expert peer reviewers in relevant fields. The review process consists of the following steps:

Step1: The editorial board will confirm receipt of the manuscript once it has been submitted in accordance with the journal's submission requirements. The editorial team will then evaluate the topic and content to determine whether it aligns with the journal's aims and scope.

Step2: If the editorial board, upon initial review, deems the manuscript academically appropriate and consistent with the aims and scope of the journal, **the editorial committee will forward the manuscript to three qualified reviewers in the relevant field. These reviewers must be external experts from various institutions and not affiliated with the author's institution. The manuscript will be evaluated through a double-blind peer review process, in which the reviewers will not know the identity of the author and the author will not know the identity of the reviewers. The three reviewers will assess the academic quality of the manuscript and determine whether it meets the standards for publication.** Based on their evaluations, the editorial board will decide whether the manuscript should be accepted for publication, returned to the author for revision and resubmission, or rejected. The final decision rests with the editor, ensuring that all published articles meet the journal's academic and editorial standards.

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## Types of Articles

Research Articles

Academic Articles

Book Review

## Publication Schedule

Issue 1 January – June

Issue 2 July – December

(Published twice a year)

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## Editorial Note

The RMUTT Global Business and Economics Review is an academic journal that has been continuously published for its 20<sup>th</sup> year by the Faculty of Business Administration, Rajamangala University of Technology Thanyaburi. The journal focuses on the fields of social sciences and humanities, with particular emphasis on business administration. Its scope covers related disciplines including business management, small and medium enterprise management, human resource management and development, international business, logistics management, aviation business management, marketing, digital marketing, accounting, finance and banking, economics, business information technology, and other fields relevant to business administration. The journal has been accredited and indexed in the Thai Journal Citation Index (TCI), Tier 1, for the period 2025–2029.

The journal is published biannually, with issues released from January–June and July–December each year. Its objective is to serve as a platform for disseminating academic research in business administration and economics and as a medium for knowledge exchange. This includes theoretical contributions, modern business perspectives, research techniques and methodologies, applied knowledge, and the sharing of research experiences among faculty members, academics, researchers, executives, entrepreneurs, students, and the public, thereby contributing to broader academic and societal benefits.

For Volume 20, Issue 2 (July–December 2025), this issue comprises 11 articles, including 9 research articles, 1 academic article, and 1 book review. All published articles have undergone a rigorous peer-review process conducted by three qualified reviewers from diverse institutions with expertise in relevant fields, ensuring academic quality and adherence to proper editorial and ethical standards.

The Editorial Board would like to express its sincere appreciation to all academics, researchers, faculty members, and students who have contributed their valuable work to this issue. Their contributions have enriched the journal with knowledge beneficial to readers and members and provide valuable references for future research. The Editorial Board also extends its deepest gratitude to the executive administrators of Rajamangala University of Technology Thanyaburi for their continued support and funding for the publication of this journal and looks forward to ongoing collaboration in promoting and disseminating academic research in the future.

Assoc. Prof. Dr. Sureerut Inmor  
**Editor-in-Chief**

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# Determinant of The Growth of Islamic Banking by Moderating Variables of Savings Interest Rate and Credit Interest Rate Evidence from Banten, Indonesia

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## Abstract

This study aims to identify the key determinants of the growth of Islamic banking in Banten Province, Indonesia, and to examine whether the presence of conventional banks acts as a moderating factor in this growth. The research utilizes monthly data spanning the period from 2019 to 2022. The analysis methods employed include Moderating and Multiple Linear Regression, which were conducted using the SPSS program version 22. Findings from this research reveal that the savings profit-sharing and financing profit-sharing significantly impact the growth of Islamic banking. Furthermore, the growth of Islamic bank assets is found to have a significant positive effect on overall Islamic banking growth. The savings interest rate is found to moderate the relationship between the savings profit-sharing and Islamic banking growth, indicating an interplay between conventional banking practices and the development of Islamic financial institutions. However, the interest rate on loans does not function as a moderating variable in the relationship between financing profit-sharing and the growth of Islamic banking.

**Keywords:** Growth of Islamic banking, Savings profit-sharing, Financing profit-sharing, Credit interest rate, Saving interest rate, Growth of Islamic banking assets

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## Introduction

There is no exact data on the number of Muslim populations in the province of Banten, but as a province which has a historical background prior to the Banten Sultanate, the majority of Banten population is Muslim. Nonetheless, this trend does not automatically linear with the growth of Islamic banking. It can be seen in 2016 when the market share grew only 3.87%, slightly increased to 4.73% in 2017, and reached 6.03% by the end of 2019 (Hasan, 2019). The low market share of Islamic banking in Banten is similar to what is happening in Indonesia. According to the study of Hasan (2019), at the end of 2016, Islamic banking's market share in Indonesia stood at 5.03%, with assets amounting to IDR 356.5 trillion.

The low growth of Islamic banking in Indonesia, particularly in the Banten Province, can be explained through the demand theory, which states that demand for products or services is heavily influenced by price. In the context of Islamic banking, financing margin or profit-sharing ratio plays a role equivalent to the interest rate on loans in conventional banks, while the profit-sharing ratio applied by Islamic banks can be considered comparable to the savings interest rate in conventional banking. Therefore, if the financing margin applied by Islamic banks is lower than the interest rates in conventional banks, and if the profit-sharing ratio is higher than the savings interest rate in conventional banks, this could potentially result in lower customer interest in Islamic banking products. In this case, price factors, such as the margin or ratio, become crucial elements in determining the demand for Islamic banking products.

Several studies have shown that financing margins or profit-sharing ratios can enhance customer trust and promote financing growth. This aligns with findings from Fardiansyah et al. (2023) and Riyadi et al. (2021), who showed that competitive financing margins can increase demand and customer trust in Islamic banking products, which in turn drives financing growth. Furthermore, Junaeni et al. (2023) found that lower financing margins could stimulate financing growth by offering more attractive incentives to customers, thus encouraging faster growth in the Islamic banking sector.

However, other studies present a different view, Ibrahim and Fajri (2024) and Sugiarto and Surahman (2025) showed that the financing margin or profit-sharing ratio does not have a significant impact on financing growth. These findings suggest that factors other than the margin or profit-sharing ratio may play a more critical role in driving financing growth. Judijanto et al. (2023) also

found that although profit-sharing-based financing can have a positive and significant effect on profitability, its overall impact on financing growth is not substantial. These studies challenge a more simplistic view of the direct relationship between profit-sharing and financing growth, highlighting the importance of other factors that need to be considered.

Additionally, there are differences in research results regarding the relationship between profit-sharing and the growth of savings in Islamic banks. Khusnia and Wardana (2024) found that higher profit-sharing rates positively affect savings growth, which is in line with the research by Salman (2023), stating that more attractive profit-sharing ratios can lead to higher savings growth. These studies indicate that profit-sharing rates have a significant positive effect on the amount of mudharabah savings, meaning that increasing the profit-sharing rate can stimulate savings growth in Islamic banks. A similar finding was found by Stalia et al. (2024), which showed that higher profit-sharing rates positively influence mudharabah savings, further emphasizing that higher rates can promote savings growth. Additionally, Putri and Ristianawati (2024), found that profit-sharing has a significant positive effect on customers' interest in saving in Islamic banks, which in turn drives savings growth.

However, different findings were presented by Purnamasari et al. (2024), who found that profit-sharing does not have a significant effect on the growth of savings. This aligns with the research by Che Arshad and Nurfadilah (2017), which showed that the return rates in Islamic banks do not significantly impact the level of savings. In fact, the study by Relasari and Soediro (2017) showed a significant negative effect of return rates on mudharabah savings, indicating that higher returns do not necessarily increase savings in Islamic banks.

These differing research findings suggest that price factors have not fully explained the low market share of Islamic banking. Therefore, utility theory can be used to explain the influence of other factors in customers' decision-making processes. According to utility theory, consumers aim to maximize the satisfaction or utility they obtain from choosing a product. While a higher profit-sharing ratio may offer better value, higher savings or credit interest rates in conventional banks could provide greater utility for customers, thus influencing their decision to choose products. By considering both savings and credit interest rates as moderating variables, this study seeks to understand how the interaction between the profit-sharing ratio and conventional interest rates influences customers' preferences for Islamic banking products.

This research aims to fill the knowledge gap by analyzing how the profit-sharing ratio in Islamic banking, considering conventional interest rates as variables, influences customers' decisions when choosing between Islamic banking and conventional banking products. Additionally, within the context of rational theory, risk factors will also be considered by consumers when making their investment decisions. Bona fide banking can serve as an indicator of risk factors. Bona fide banking can be measured by the size of the company and the number of Islamic banking offices, meaning that company size and the number of offices can become considerations in making investment decisions in Islamic banking. Focusing on Banten Province as a case study, this research is expected to provide deeper insights into the factors influencing the growth of Islamic banking in the region. This is crucial for helping Islamic banks enhance their competitiveness, thereby expanding their market share and contributing to the growth of Islamic finance in Indonesia.

## Literature Review

Utility Theory and Demand Theory can be used to explain the low market growth of Islamic banking, particularly in Banten Province. According to demand theory, the demand for a product is influenced by its price as well as other factors, such as consumer income, preferences, and the prices of substitute or complementary goods. In the context of Islamic banking, the savings profit-sharing ratio (X1) and the financing profit-sharing ratio (X4) serve as price factors that influence customers' decisions to choose Islamic banking products. The higher the profit-sharing ratio offered by an Islamic bank, the greater the benefit or satisfaction customers receive, which in turn can increase demand for Islamic savings and financing products.

However, aside from price factors, utility theory reveals that consumers also act to maximize the satisfaction or utility they derive from choosing a product or service. In the context of Islamic banking, besides price factors, there are non-price factors that influence customer decisions, such as the size of the company (X2) and the number of offices (X3). The larger the company's size and the greater the number of offices an Islamic bank has, the higher the utility perceived by consumers, as they feel more secure and have easier access to banking services. Therefore, these factors also influence customers' decisions to select Islamic banking products.

Additionally, external factors such as the savings interest rates at conventional banks (Z1) and the credit interest rates at conventional banks (Z2) also play an important role in consumer

decisions. According to utility theory, consumers will compare Islamic banking products with conventional banking products, particularly in terms of the financial benefits offered. If the interest rates at conventional banks are higher than the profit-sharing rates offered by Islamic banks, consumers may choose conventional banks because they perceive higher utility. On the other hand, if Islamic banks offer more competitive profit-sharing ratios, consumers are likely to choose Islamic products, as they feel more satisfied with the benefits they receive.

Demand theory also explains that demand for Islamic banking products is influenced by two types of variables: price and non-price. In this case, price variables, proxied by the financing profit-sharing ratio (X4) and the savings profit-sharing ratio (X1), act as the main factors influencing demand. Meanwhile, non-price variables such as the size of the company (X2) and the number of offices (X3) contribute to the ease of access and credibility perceived by consumers, ultimately affecting their decisions to choose Islamic banking.

Based on demand and utility theory, it can be concluded that the growth of the Islamic banking market depends not only on price factors but also on non-price factors such as ease of access, bank stability, and future expectations. In this regard, if Islamic banking can improve one or both of these factors, the market growth (Y) in the Islamic banking sector will increase. Thus, the combination of price and non-price variables provides a more comprehensive understanding of the factors influencing the growth of Islamic banking, particularly in Banten Province

The profit rate set by an Islamic bank influences the decision of individuals to deposit their funds. An increase in the profit rate is expected to lead to an increase in the amount of deposits. This relationship is supported by previous studies by Anisah et al. (2013), Hilman (2016), Meyliana and Mulazid (2017), and Rusydiana and Prakoso (2021), which found that the profit rate has a positive effect on Islamic bank deposits. Therefore, researchers formulated the hypothesis as follows:

H1 : An increase in the savings profit-sharing ratio will lead to greater growth in Islamic banking

The size of a company is closely related to its credibility, which significantly influences customer trust. Larger business scales tend to gain greater trust from customers. Similarly, the larger the size of an Islamic bank, the greater the potential growth of its services. This relationship is supported by previous studies from Anisah et al. (2013), Meutia et al. (2024), and Yulianto et al.

(2021), which found a significantly positive effect of company size on the growth of Islamic banking. This becomes the researchers' base to formulate the following hypothesis:

H2: An increase in the size of Islamic banking will lead to greater growth in Islamic banking.

The number of offices is closely associated with the reputation and credibility of a bank. An increase in the number of offices, spread across various regions, enhances customer trust in the bank's presence and reliability. According to signaling theory, the number of offices signals to customers that the bank is reputable. Studies by Manggu et al. (2024) and Meyliana and Mulazid (2017) have demonstrated that the number of banking offices significantly impacts the growth of third-party funds in Islamic banking, thus a hypothesis can be formulated as follows:

H3: An increase in the number of offices will lead to greater growth in Islamic banking.

The demand for financing is a function of the financing ratio. As the financing ratio increases, the demand for financing decreases. Conversely, when the cost of using money decreases, the demand for financing in Islamic banks increases. The relationship between price and demand can also be explained by marketing mix theory, which asserts that a product's marketing is influenced by the factors of product, price, place, and promotion. The research by Hidayat (2016) supports this relationship. In accordance with the explanation, the following hypothesis is formulated:

H4: An increase in the financing ratio will lead to a decrease in the growth of Islamic banking.

The savings interest rate of conventional banks can serve as competition for Islamic banks, assuming that the customers of Islamic banks are non-loyalists. These customers may switch to an Islamic bank if the profit-sharing ratio meets their expectations. According to Nini et al. (2020), although Islamic banks do not operate on interest, individuals may still be attracted to invest in conventional banks offering higher profits. Therefore, the following hypothesis can be formulated:

H5: The savings interest rate of conventional banks will reduce the effect of the savings profit-sharing ratio on the growth of Islamic banks.

The credit interest rate of conventional banks can serve as competition for Islamic banks, assuming that Islamic bank customers are non-loyalist and some fall within the floating market segment. Non-loyalist customers and those in the floating market segment will switch to an Islamic bank if the payment rate aligns with their expectations. Therefore, when the credit interest rate offered by conventional banks is lower, customers of Islamic banks may move to conventional banks.

H6: The credit interest rate of conventional banks will reduce the effect of the financing ratio on the growth of Islamic banking.

## Methodology

This research uses quantitative data with a Moderated Regression Analysis (MRA) approach to examine the impact of various variables on the growth of Islamic banking. The dependent variable used is the growth of Islamic banking ( $Y$ ), while the independent variables include the savings profit-sharing ratio ( $X_1$ ), the number of offices ( $X_2$ ), the size of the company ( $X_3$ ), and the financing profit-sharing ratio ( $X_4$ ). Two moderating variables, namely the savings interest rate ( $Z_1$ ) and the credit interest rate ( $Z_2$ ) at conventional banks, are also analyzed to test the external influence on the relationship between the independent and dependent variables. Data collection is carried out through documentation from trusted secondary sources such as OJK and BPS.

Each variable is clearly measured. The savings profit-sharing ratio ( $X_1$ ) in Islamic banks represents the rate of investment earnings received by customers. This ratio is calculated as the average growth across various types of savings in all Islamic banks. The number of Islamic bank offices ( $X_2$ ) refers to the growth number of Islamic banks operating in the area. The size of the Islamic bank company ( $X_3$ ) is measured by the growth average total assets of Islamic banks. The financing profit-sharing ratio ( $X_4$ ) in Islamic banks reflects the cost of funds required to obtain financing, which becomes the customer's expense. This ratio is calculated as the average across various types of financing in all Islamic banks. The savings interest rate ( $Z_1$ ) at conventional banks is the average percentage of savings interest rates at conventional banks. The credit interest rate ( $Z_2$ ) at conventional banks is the average percentage of credit interest rates at conventional banks. The growth of Islamic banking ( $Y$ ) includes the growth of Islamic banks, measured by the growth in the number of customers.

Before the analysis, basic regression assumptions, including linearity, multicollinearity, residual normality, and homoscedasticity, are tested. With this approach, the research aims to produce valid and reliable findings in accordance with proper statistical principles. The Moderated Regression Model used is:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e \dots (1)$$

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_1 * Z_1 + \beta_6 X_4 * Z_2 + e \dots (2)$$

Description:

Y = the growth of Islamic bank (PBS)

$\alpha$  = Constance

$X_1$  = savings profit sharing ratio (BGS)

$X_2$  = the number of Islamic bank offices (GJK)

$X_3$  = the size of Islamic bank company (GTA)

$X_4$  = financing profit sharing ratio in Islamic bank (BHP)

$Z_1$  = savings interest of conventional bank (BSK)

$Z_2$  = credit interest of conventional bank (BKK)

$X_7 = X_1 * Z_1$  interaction

$X_8 = X_4 * Z_2$  interaction

e = Error residual from each variable

The model must satisfy the classical assumptions of regression. Five key assumptions are required: normality, multicollinearity, Linearity, heteroskedasticity, and autocorrelation. Hypothesis testing is conducted at a 95% confidence level. However, if the hypothesis is not accepted at a significance level of  $\alpha = 5\%$ , the significance level will be increased to  $\alpha = 10\%$ . This is based on the consideration that, in the context of social science research, a 90% confidence level is still acceptable, given the higher variability of the data and the need for a more flexible significance threshold (Agresti and Finlay, 2008).

## Results and Discussion

### Descriptive Statistics

The table below presents the results of the descriptive statistics analysis. This research includes 48 observations, representing monthly data over four consecutive years (2019–2022). The results of the descriptive analysis show that GJK (the growth of the number of Islamic bank offices), GTA (the growth of the total assets of Islamic banks), and PBS (the growth of Islamic banks) fluctuated during the research period. This can be observed from the standard deviation value, which is greater than the mean. This also indicates that the data for these three variables is

heterogeneous or has a high rate of deviation. Meanwhile, other variables show a more stable fluctuation rate, as indicated by the mean value being higher than the standard deviation.

The mean for the savings profit-sharing ratio (BGS) is smaller than the savings interest rate at conventional banks (BSK), meaning that when viewed from the savings profit-sharing rate in conventional banks, conventional banks provide more profits compared to Islamic banks. The mean for the financing profit-sharing ratio (BHP) is lower when compared to the credit interest rate at conventional banks (BKK). This means that, when viewed from the credit profit rate, conventional banks charge higher capital costs compared to Islamic banks.

**Table 1** Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
BGS	48	2.59	4.61	3.3102	.36473
BHP	48	8.96	11.81	10.4219	.94335
GJK	48	-10.68	12.16	.0531	2.56571
GTA	48	-28.25	43.80	1.5479	7.85081
BSK	48	5.64	7.51	6.4113	.45491
BKK	48	10.52	12.79	11.4737	.68523
PBS	48	-6.05	9.38	1.2968	1.84866
Valid N (listwise)	48				

### Regression model test

Normality testing is conducted on model one. It uses Kolmogorov Smirnov test which probability value is 0.05. From the data processing, it can be seen that the significance value (Asymp. Sig 2-tailed) is 0.995. Since the significance value is greater than 0.05 ( $0.995 > 0.05$ ), the residuals are considered normally distributed.

Multicollinearity testing was conducted on Model One. The results are presented in Table 2. Based on the analysis, it is concluded that there is no indication of multicollinearity in the model. This is evidenced by the Variance Inflation Factor (VIF) values for all variables, which do not exceed the threshold ( $VIF < 3$ ), and the Tolerance values, which approach 1.

**Table 2** Multicollinearity Test

Model		Correlations			Collinearity Statistics	
		Zero-order	Partial	Part	Tolerance	VIF
1	BGS	.466	.420	.379	.876	1.142
	BHP	.194	.273	.233	.981	1.019
	GJK	-.054	.006	.005	.982	1.018
	GTA	-.378	-.267	-.227	.878	1.139

Statistical test to detect heteroskedasticity is conducted with spearman correlation, by using 48 (n=48) numbers of data, heteroskedasticity is detected. In order to overcome it, omission of outlier data is conducted, thus the number of data becomes 38 (n=38). Table 3 presents the results of the heteroskedasticity test.

**Table 3** Heteroskedasticity Test

		BGS	BHP	GJK	GTA	Uns Res
BGS	Correlation	1.000	-.101	-.060	-.152	-.365
	Coefficient					
	Sig. (2-tailed)	.	.495	.687	.301	.110
BHP	Correlation	-.101	1.000	-.428	.031	.093
	Coefficient					
	Sig. (2-tailed)	.495	.	.002	.835	.532
GJK	Correlation	-.060	-.428	1.000	.204	.079
	Coefficient					
	Sig. (2-tailed)	.687	.002	.	.164	.595
GTA	Correlation	-.152	.031	.204	1.000	-.003
	Coefficient					
	Sig. (2-tailed)	.301	.835	.164	.	.982
Uns.Res	Correlation	-.365	.093	.079	-.003	1.000
	Coefficient					
	Sig. (2-tailed)	.011	.532	.595	.982	.

Note: \*\*. Correlation is significant at the 0.01 level (2-tailed).

The result of data processing shows that correlation significance value for all independent variables with unstandardized residual is more than 0.05. Therefore, it can be concluded that there is no heteroskedasticity problem in the research model.

**Table 4** Compare Means Linearity Test

No	Variable	Sig.
1	PBS * BGS	0.000
2	PBS * BHP	0.025
3	PBS * GJK	0.037
4	PBS * GTA	0.049

From the processing output, it can be observed that the significance value for the linearity test of all independent variables with respect to the dependent variable is less than 0.05. Since the significance is less than 0.05, it can be concluded that there is a linear relationship between the dependent and independent variables.

**Table 5** Autocorrelation Test Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.571a	.326	.263	1.58672	1.919

a Predictors: (Constant), GTA, BHP, GJK, BGS

b Dependent Variable: PBS

Based on the results of the analysis, the DW value derived from the regression model is 1.919. Referring to the DW table with a significance level of 0.05, a sample size (n) of 44, and k = 4 (where k is the number of independent variables), the values of dL and dU are obtained as 1.3263 and 1.7298, respectively (see the DW Table). Since the DW value (1.919) falls between dU = 1.7298 and  $(4 - 1.7298 = 2.2702)$ , the null hypothesis is accepted, indicating that there is no autocorrelation.

### Hypothesis Test and Discussion

To test hypotheses one through four, the data in Table 6 are used to analyze the correlations between variables and evaluate statistical significance of the proposed models. The

result shows that the significance level of savings profit-sharing ratio variable is 0.004, less than 0.05, thus, H1 is accepted. This indicates that the savings profit-sharing ratio is a variable that negatively affects the growth of Islamic banking. Thus, profit sharing as a return on savings affects the number of demands in Islamic banks. This research reinforces the theories of demand and utility and supports the research of Anisah et al. (2013); Hian (2016); Meyliana and Mulazid (2017); Rusydiana and Prakoso (2021).

The variable of the company size has a significance rate of 0.070, more than that of 0.05. However, if the confidence level is increased to 10%, the hypothesis is accepted. This shows that the company size does have affect on the number of the growth of Islamic banks. The result indicates that the level of banking credibility is accompanied by customer trust in utilizing Islamic banking services. Accordingly, this research has support the previous research proving that company size has a significantly positive effect on the increase of the growth of Islamic banking (Anisah et al., 2013).

Hypothesis three is accepted, as evidenced by the significance level of the number of branch offices, which is 0.968—greater than 0.05. By the result of testing of the number of offices of Islamic bank, although its regression coefficient is positive, it is not significantly proven to affect the growth of Islamic banking. It means that, by expanding its network access through adding the number of offices has not been able to significantly increase the ability of Islamic banks to be able to increase the number of their customers. This research result is different with the results of Meyliana and Mulazid (2017).

The testing of hypothesis four resulted in a significance level of 0.077, which is greater than 0.05 but less than 0.10. Based on the assumption of a 90% confidence level, the hypothesis is accepted. This finding indicates that with a 90% confidence level, the result, which was previously not significant at  $\alpha = 5\%$ , becomes significant at  $\alpha = 10\%$ . This suggests that the financing ratio has a negative effect on the price of financing, which in turn leads to a decrease in the demand for financing. This finding aligns with the marketing mix theory, which states that the price of a product influences its sales. Additionally, this result reinforces previous findings from Hidayat (2016), that demonstrate the relationship between price and demand in the context of financing, offering further insights into the dynamics of the financing market sector.

**Table 6** Multiple Linear Regression Hypothesis Testing

Model		Unstandardized		Standardized	T	Sig.
		Coefficients		Coefficients		
		B	Std. Error	Beta		
1	(Constant)	-10.219	3.599		-2.840	.007
	BGS	2.055	.678	.405	3.031	.004
	BHP	.461	.248	.235	1.859	.070
	GJK	.004	.091	.005	.041	.968
	GTA	-.057	.031	-.242	-1.815	.077

The testing of hypothesis five uses data processing results as shown on Table 7. The analysis results indicate that the savings interest rate at conventional banks significantly and negatively moderates the relationship between the savings profit-sharing ratio and the growth of Islamic banking. This finding is supported by a significance level smaller than 0.05 (0.014), which suggests that the hypothesis is accepted, and the moderating effect can be considered valid.

The interpretation of this finding is that the savings interest rate at conventional banks moderates the relationship between the savings profit-sharing ratio and the growth of Islamic banking in a negative manner. In other words, when the savings interest rate at conventional banks increases, customers tend to be more attracted to choose savings products from conventional banks due to the higher returns. This reduces customer interest in selecting savings products offered by Islamic banks, even though Islamic banks provide more competitive profit-sharing rates.

This phenomenon illustrates that banking customers in Banten Province are not loyal to Islamic banks. They prefer products that offer higher financial benefits, in line with the Axioms of Rational Choice in utility theory, which states that consumers act to maximize the satisfaction or utility they gain from choosing a product or service. In this case, even though Islamic banks offer more attractive profit-sharing, customers prefer conventional bank products when the savings interest rate is higher because they perceive greater utility from the interest received.

This finding also strengthens the demand theory, which states that the demand for a product is highly influenced by the price or return of other similar products. In this context, the

higher savings interest rates at conventional banks affect the demand for savings products at Islamic banks, ultimately leading to a decline in the growth of Islamic banking in the region.

The testing of hypothesis six uses the data processing results presented in Table 7. The analysis shows a significance level of 0.074, meaning that the hypothesis is rejected. The hypothesis previously formulated assumed that the credit interest rate at conventional banks would negatively moderate the relationship between financing levels and the growth of Islamic banking. However, the testing results show that the credit interest rate at conventional banks does not moderate the relationship between financing and the growth of Islamic banks.

The interpretation of this finding is that, despite higher credit interest rates at conventional banks, no negative moderating effect occurs between financing levels and the growth of Islamic banks. This phenomenon suggests that, even though credit interest rates at conventional banks fluctuate, they do not drive significant changes in customers' decisions to switch to Islamic banks or affect the growth of Islamic banks. This finding may indicate that other factors, such as product quality, services, or other economic factors, have a greater influence on customers' decisions when choosing between conventional and Islamic banks.

This finding also suggests that utility theory and demand theory may not fully apply in this context, or that credit interest rates are not a sufficient factor influencing demand for Islamic banking products. Instead, other factors may be more influential, such as perceptions of long-term benefits or the stability of the Islamic bank itself.

**Table 7** The Testing of Savings Interest Rate Moderating Regression Hypothesis at Conventional Banks and The Testing of Credit Interest Rate Moderating Regression Hypothesis at Conventional Banks

Model	Unstandardized	Standardized	Standardized	T	Sig.
	Coefficients	Coefficients	Coefficients		
	B	Std. Error	Beta		
(Constant)	-18.473	13.210		-1.398	.170
BGS	9.884	4.018	1.950	2.460	.018

**Table 7** The Testing of Savings Interest Rate Moderating Regression Hypothesis at Conventional Banks and The Testing of Credit Interest Rate Moderating Regression Hypothesis at Conventional Banks (Continued)

Model	Unstandardized	Standardized	Standardized	T	Sig.
	Coefficients	Coefficients	Coefficients		
	B	Std. Error	Beta		
BHP	-.033	1.492	-.017	-.022	.983
GJK	-.007	.080	-.009	-.084	.933
GTA	-.068	.036	-.287	-1.855	.071
SAVINGS_INTERACTION	-.681	.266	-1.927	-2.557	.014
LOAN_INTERACTION	.110	.060	1.096	1.833	.074

## Conclusion

The growth of Islamic banks is the primary focus of this study. This research aims to examine the role of conventional bank lending rates and deposit interest rates as moderating factors that influence the volume of deposits and financing in Islamic banks in Banten Province. The findings of the study show that the deposit interest rate at conventional banks significantly negatively moderates the relationship between savings returns and deposit growth, while the credit interest rate does not moderate the relationship between financing returns and financing growth, with a positive direction coefficient even being found. This indicates that, although Islamic banks offer competitive profit-sharing ratios, higher deposit interest rates at conventional banks can reduce deposit growth at Islamic banks, while higher credit interest rates do not drive financing growth at Islamic banks.

Furthermore, the study also indicates that the growth of Islamic bank assets significantly influences the growth of Islamic banking, highlighting the importance of asset management as a key factor in expanding the impact and market share of Islamic banks. To date, Islamic banks have sought to expand their influence by offering a variety of services with competitive profit-sharing ratios, as well as increasing access through the expansion of branch offices.

Nevertheless, the presence of competitors, particularly conventional banks, remains a significant challenge for Islamic banking. Therefore, Islamic banks need to be more innovative in

attracting customers, strengthening their competitiveness, and capitalizing on market opportunities by offering differentiated value from conventional banks. With the right strategies, Islamic banks in Banten Province can further expand their market share and contribute to the overall growth of the Islamic banking sector

### Limitation

This research has limitations related to government regulations that may change, which can affect the Islamic banking sector and the results of the study itself. Government policies regarding profit-sharing rates, financing terms, and incentives often change, which can influence both consumer decisions and banking practices. Additionally, the limited number of observations (38 samples) restricts the ability to generalize the findings to a larger population. A small sample size also increases the potential for bias in the results, as well as geographical limitations, being confined to Banten Province, which may affect the relevance of the findings for other regions or countries.

The method used, namely correlation analysis, can only show the relationship between variables but cannot establish causal relationships. This means that while significant relationships between variables may be found, this study cannot confirm that one variable directly causes changes in another. Furthermore, hidden variables that could influence the results, such as external socio-economic factors or government policies not included in the research model, have not been considered. To strengthen the research findings, further studies with more comprehensive methods and larger sample sizes are needed.

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# Developing Attributes of Luxury Chain Hotels in Thailand to Enhance Experience, Delight and Trust for Excellent Service in Accommodating Senior Travelers

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## Abstract

This study examines how luxury hotel chain characteristics in Thailand influence the experiences of senior tourists, with a focus on satisfaction and trust. Using structural modeling to analyze causal relationships, the research evaluates how key hotel attributes shape senior guests' experiences in high-end accommodations. Reliability testing confirmed strong measurement scales, with Cronbach's alpha values between 0.81 and 0.95. Data collected through an e-questionnaire from 629 senior travelers show that luxury hotel attributes significantly affect customer experience management, which in turn influences satisfaction and trust. The proposed structural equation model demonstrated an excellent fit with the empirical data, supported by strong indices: Chi-square = 183.095,  $df = 120$ , CMIN/DF = 1.526, RMSEA = 0.032, RMR = 0.007, GFI = 0.965, and TLI = 0.979. These results validate the robustness of the conceptual framework. Findings indicate that while physical facilities and service quality are essential, a holistic approach to customer experience is needed, one that integrates emotional and creative elements to meet the evolving expectations of senior guests. Effective experience management enhances satisfaction and trust, but hotels must balance emotional engagement with operational reliability

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to maintain credibility. Practically, the study highlights the need for luxury hotels to combine functional excellence with emotional value creation to build lasting relationships with senior travelers. Future research should explore how external factors further shape trust and loyalty.

**Keywords:** Senior travelers, Luxury chain hotels, Customer experience, Customer delight, Customer trust

## Introduction

The global population is aging rapidly, with people having fewer children and living longer. According to the 2021 United Nations World Population Aging Report, the number of individuals aged 60 and above is expected to double by 2050, growing from 1 billion in 2022 to over 2 billion (Tsao et al., 2022). This demographic shift highlights the increasing prominence of seniors, who now lead healthier, more active lifestyles and often travel during off-peak seasons. Over the past decade, senior tourism has become a key global market, driven largely by travelers from Europe and North America (Vergori & Arima, 2020). Seniors generally possess substantial disposable income accumulated over their lifetimes and are willing to invest in leisure and international travel (Fu et al., 2022). With fewer family obligations and more flexible schedules (Diekmann et al., 2020), this market is expected to continue expanding and significantly influence global tourism and hospitality.

Thailand is also entering an aging society. In 2021, seniors aged 60 and above accounted for 20% of the population, or 13 million people (Teerawichitchainan et al., 2019). By 2042, this number is projected to reach 20 million, one in every three Thais, of whom 3.5 million will be 80 or older (Upasen et al., 2024). International senior tourists contribute approximately 45 billion THB (1.22 billion USD) annually, representing 18.6% of Thailand's tourism revenue (Pookaiyaudom & Tan, 2020). Growth is strong among seniors from Japan, the United States, the United Kingdom, Germany, and France, attracted by Thailand's cultural heritage, diverse attractions, natural beauty, and globally recognized cuisine (Arain et al., 2020). As competition intensifies, the Thai tourism sector must adapt its marketing strategies to different segments.

Understanding diverse travel motivations enables hotels to design offerings aligned with behavior and expectations. Hotels use strategies such as digital, sustainable, and relationship marketing (Tanford et al., 2020; Choi & Kandampully, 2019), while luxury and experiential

marketing are especially prevalent. However, identifying approaches that match market trends remains challenging. In a competitive environment, delivering memorable experiences that exceed expectations is critical for long-term success (Padma & Ahn, 2020). Delight, created through positive emotional responses, provides competitive differentiation (Wu & Gao, 2019). For seniors, understanding the emotional factors that shape joy and satisfaction is increasingly important (Hwang & Lee, 2019).

The rising senior population has led both government and private sectors to recognize this market's potential. Many organizations now focus on senior-friendly services and accessible facilities (Lee & King, 2019). Scholars emphasize integrating Customer Experience (CEX) into luxury hotel strategies to enhance engagement and loyalty (Lemon & Verhoef, 2016). Managing the entire guest journey strengthens service value and competitiveness (Scerri & Presbury, 2020). Despite senior travelers' importance, research on their needs, especially in luxury hotels, remains limited. Seniors staying in luxury properties prioritize service quality and location over cost (Lee & King, 2019), yet little is known about the specific characteristics of luxury hotel chains that influence their satisfaction and trust in Thailand. This study therefore examines key attributes of luxury chain hotels that shape senior travelers' experiences, focusing on service quality, trust, satisfaction, and their structural relationships.

## Literature review

The theoretical framework in Figure 1 integrates eight models that collectively offer diverse perspectives on customer experience (CEX). Service-Dominant (S-D) Logic redefines value creation through co-creation between businesses and customers (Vargo & Lusch, 2004). While it enhances personalization, its application in luxury hospitality is challenging, as high-end service often prioritizes seamless delivery over active guest participation (Buhalis et al., 2023). This is especially relevant for senior travelers, who may prefer passive enjoyment rather than co-creation (Sugathan & Ranjan, 2019). Thus, tailoring S-D Logic to different customer groups is essential. The Experience Economy Framework (Pine & Gilmore, 2011) categorizes experiences into Entertainment, Educational, Esthetic, and Escapism, yet this may oversimplify the depth of luxury experiences, which demand emotional immersion and personalization (Klink et al., 2020). Similarly, touchpoint and journey mapping optimize specific interactions but may overlook the

long-term emotional journey crucial for loyalty in luxury contexts (Lemon & Verhoef, 2016). Disconfirmation of Expectations Theory (Oliver, 1980) argues that exceeding expectations leads to delight. However, in luxury hospitality, where expectations are already high, constant elevation may create a satisfaction trap (Kopalle & Lehmann, 2001). The Customer Delight Three-Dimensional Framework expands beyond expectations by highlighting emotional, cognitive, and behavioral aspects (Ma et al., 2013). While emotional engagement is essential, consistent and reliable service remains the foundation of trust in luxury settings (Kumar et al., 2019). Trust-focused models such as Commitment-Trust Theory (Hunt & Morgan, 1994) and Social Exchange Theory (Blau, 2017) emphasize mutual reliance but often overlook modern digital trust concerns, including transparency and data privacy (Walker, 2016). The Trust-Commitment Framework (Garbarino & Johnson, 1999) highlights risk reduction but may downplay emotional and relational elements that significantly influence trust in luxury service environments (Huang & Rust, 2021). Based on these insights, the study proposes a conceptual framework with observable variables to guide research on elevating experiences, delight, and trust for senior travelers in luxury chain hotels in Thailand illustrated in Figure 1.

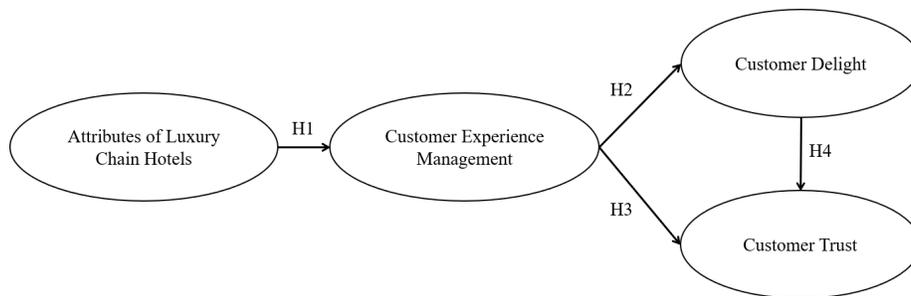


Figure 1 Research conceptual framework

### The Relationship between luxury hotel characteristics and customer experience

Luxury hotel chain characteristics play a crucial role in shaping Customer Experience (CEX), influencing both satisfaction and loyalty. Key attributes such as luxurious design, comprehensive amenities, and exceptional service are central to creating memorable guest experiences (Jain et al., 2023). Design and décor form the first impression, with unique, high-quality elements that reinforce exclusivity and brand identity, enhancing the guest’s sense of value (Lockwood et al., 2023). Attention to detail through premium materials, elegant lighting, and harmonious color

schemes further supports a welcoming ambiance that meets expectations (Xu et al., 2022). Amenities such as spas, fitness centers, pools, and fine dining significantly enhance CEX when they are high-quality and well-maintained, contributing to a seamless stay (Chi et al., 2024). Exceptional service is fundamental to CEX management. Prompt, professional, and personalized service increases satisfaction and leaves a lasting impression (Balinado et al., 2021). Staff trained to anticipate needs and provide personalized touches strengthen warmth and care (Kim & Han, 2020). Efficient complaint handling and continuous monitoring of customer feedback also improve service refinement (Luo et al., 2021). Loyalty programs, exclusive benefits, and personalized experiences foster repeat visits and long-term engagement (Chaudhuri et al., 2019). Overall, luxury hotel characteristics influence CEX by consistently exceeding expectations. The hypothesis is as follows:

H1: The attributes of luxury hotel chains positively impact customer experience management

### **Customer delight**

Customer delight is a key performance indicator that measures the extent to which customer expectations are met or exceeded (Torres et al., 2020). One crucial element in achieving customer satisfaction, especially in the service industry, is the interaction between customers and frontline staff (Ngo et al., 2020). Frontline employees have the potential to build relationships between customers and the brand. They can surprise customers by showing genuine personal interest, providing minimal attention that may address or solve specific needs (Sok et al., 2018). Customer experiences with adverse interactions can be a significant source of delight, as they can be tailored to meet specific customer needs (Oliver et al., 1997). Finn (2012) analyzed customer satisfaction by examining behaviors that affect satisfaction linearly, while controlling for various satisfaction outcomes. Finn's study measured delight as exuberance, elevation, and pleasure. Finn's (2012) articles on measuring customer satisfaction, which developed from Oliver et al. (1997), show similar emotional assessments to evaluate factors related to delight, surprise consumption, positive outcomes, and arousal. Finn's research significantly advanced methods for measuring customer satisfaction. However, Finn suggested that emotions related to delight are distinct from those connected to surprise consumption, positive outcomes, and arousal. Barnes et

al. (2015) assessed Finn's three levels and asked employees to gauge how satisfied their customers were. Similarly, Ludwig et al. (2017) used Finn's three measures, along with excitement and cheerfulness, to evaluate how satisfied other customers were perceived to be.

### **Customer trust**

Customer trust has garnered significant attention from researchers over recent decades as global business competition has intensified. Customer trust is akin to an intangible asset that can confer a competitive advantage. It has increasingly become a crucial success factor in the 21st century (Kumar, 2018). Competitive advantage results from customer trust, which is reflected in an organization's reputation. Organizations that earn customer trust enhance their reputation (Kim, 2019). Conversely, a strong reputation can further bolster customer trust. An organization's reputation has a positive relationship with its financial performance (Singh et al., 2020). Customer trust also helps companies maintain sales from loyal customers who are confident in purchasing products and services, regardless of the offerings (Paparoidamis et al., 2019). This reduces advertising and promotional costs, minimizes control mechanisms, and enhances the efficiency of resolving conflicts within management processes. McAllister (1995) conceptualized customer trust into two dimensions: (1) Cognitive Trust: involves recognizing that individuals choose to trust entities deemed reliable under specific circumstances and based on perceived sound reasons. Cognitive trust represents the willingness and confidence customers place in a service provider based on their perceived ability (Johnson & Grayson, 2005). It is derived from accumulated knowledge that allows individuals to predict outcomes with a certain level of confidence (Riegelsberger et al., 2005); (2) Affective Trust – This refers to the emotional connection where individuals genuinely care and believe in the positive attributes and anticipate that these feelings will be reciprocated (X.-P. Chen et al., 2014). Affective trust is characterized by a sense of security and the perception of the strength of the relationship (Johnson & Grayson, 2005).

### **The impact of customer experience on customer delight and trust**

Effective Customer Experience (CEX) plays a vital role in fostering customer delight and trust, significantly impacting both. By creating positive experiences and meeting customer expectations, organizations can greatly enhance satisfaction and confidence (Ahrholdt et al., 2019). CEX goes beyond fulfilling basic needs; it focuses on making customers feel valued and

well-cared-for, which can deeply influence their trust and sense of delight. An effective CEX begins with understanding customer needs and expectations (Witell et al., 2020). Gathering data through surveys and feedback helps tailor experiences to meet these expectations (McColl-Kennedy et al., 2019). Key factors such as convenience, staff friendliness, and responsiveness contribute to higher customer satisfaction by reducing stress and enhancing the overall experience (Roy et al., 2018). When CEX is well-executed, it leads to increased customer delight, which occurs when service exceeds expectations (Ali et al., 2018). Quick responses, attention to detail, and high-quality service foster customer happiness, often resulting in positive reviews, recommendations, and repeat business (Parasuraman et al., 2021). Customer trust is also directly influenced by CEX. Trust is built when customers feel confident in an organization's reliability, honesty, and ability to fulfil promises (Ndubisi & Nataraajan, 2018). Effective CEX enhances trust through consistent service quality, transparent communication, and prompt resolution of issues (Stevens et al., 2018). This trust strengthens long-term customer relationships, leading to greater retention and attracting new clients. Demonstrating commitment to excellent service and managing customer expectations effectively also boosts future interactions (Iglesias et al., 2020). Ultimately, the strong link between CEX, customer delight, and trust underscores the importance of delivering consistent, high-quality service to build lasting, sustainable relationships. Based on the literature review, the influence of CEX on customer delight and trust has been identified. The following hypotheses have been proposed:

H2: Customer experience management positively impacts customer delight.

H3: Customer experience management positively impacts customer trust.

### **The impact of customer delight on customer trust**

Customer delight is a key driver of organizational success and long-term customer relationships. It occurs when customer expectations are exceeded, leading to enhanced satisfaction and happiness (Ahrholdt et al., 2019). Delight is created through high-quality service, prompt responses, and exceptional experiences (Buhalis & Sinarta, 2019). More than a fleeting emotion, it forms the foundation for building trust in an organization. When customers are delighted, they feel valued and cared for, which fosters confidence in the organization's ability to consistently provide exceptional service. Delighted customers are more likely to trust the

organization for future interactions, as they perceive it as reliable and capable of meeting their needs (Ozdemir et al., 2020). Trust built through delight strengthens relationships and promotes loyalty, encouraging customers to return and recommend the organization to others (Kumar et al., 2019). Trust derived from customer delight also boosts an organization's credibility. Positive reviews and recommendations from delighted customers enhance the organization's reputation, attracting new clients and retaining existing ones (Beckers et al., 2018). The credibility built through these positive experiences helps the organization stand out in a competitive market, as delighted customers become advocates who influence potential customers (Tran & Strutton, 2020). To sustain the positive effects of customer delight, organizations must continuously manage and improve customer experiences (Ahrholdt et al., 2019). Consistently high service standards, effective responses to feedback, and ongoing enhancements in customer experience (CEX) are essential for maintaining trust and fostering long-term relationships (Iglesias et al., 2020). In this way, customer delight plays a critical role in building and maintaining trust, ensuring sustained success for the organization. Based on the literature review, the influence of customer delight on customer trust has been identified. The following hypothesis has been proposed:

H4: Customer delight positively impacts customer trust.

### **Research methodology**

This research utilizes a quantitative approach which employed a convenience sampling method to ensure a diverse and representative sample of senior travelers (60+ years old) in Thailand, focusing on their experiences when staying in upscale hotels. Combining a scenario-based approach with Structural Equation Modeling (SEM) is crucial for analyzing the intricate connections among CEX, customer delight, and customer trust. Sarstedt et al. (2020) recommend a sample size of 10 to 20 times the number of observed variables for robust SEM analysis, making 670 respondents a sufficient sample size. Having a sample size in this range, with 67 variables observed, guarantees the reliability and validity of the SEM findings, thus establishing a strong basis for making significant conclusions. Participants were recruited through electronic questionnaires via email and online platforms, including social media, travel forums, and senior-specific websites. This method leveraged seniors' growing digital literacy, allowing convenient,

cost-effective participation. It ensured a broad, representative sample, meeting the required size to explore luxury hotel attributes' impact on senior travelers' experiences.

### Measurement and analysis

The four constructs examined in this study were assessed using multi-item scales with a 5-point Likert format. Specifically, the attributes of luxury chain hotels were measured using seven items adapted from W.-Y. Chen et al. (2014). CEX was evaluated with four items based on the framework of Alnawas and Hemsley-Brown (2019). Customer delight was assessed through three items derived from Xiong et al. (2022), while customer trust was measured using two items from J. J. Kim et al. (2019). The reliability of the measurement scales was confirmed with Cronbach's alpha scores ranging from 0.81 to 0.95, surpassing the acceptable threshold of 0.7 as recommended by (Hair et al., 2011). The analysis was performed using SPSS version 23 in conjunction with AMOS version 23. SEM was executed in two stages, in line with the methodology outlined by Fornell and Larcker (1984). The first stage involved assessing the measurement model by evaluating the outer loadings and applying established criteria for validity and reliability. To address Common Method Bias (CMB), the researcher adhered to the guidelines of Podsakoff et al. (2012), incorporating several procedural steps in the instrument design. These included ensuring respondent anonymity, implementing proximal separation of items, simplifying response accuracy, and conducting both a pre-test and a pilot test. Additionally, an experimental scenario design was employed to increase response variability, as advised by Rupp et al. (2013). A statistical control test using Harman's single factor technique was also performed to further mitigate potential bias (Harman, 1976).

### Results

The respondent profile consisted of 629 participants, 62% of whom were female. The majority, 74%, held at least a bachelor's degree. In terms of income, 58% earned more than USD 2,500 per month. Most respondents, 72%, were married with children, and 66% resided in central Thailand. The multi-item scales for SEM analysis, measuring four constructs related to luxury chain hotels are: Attributes of Luxury Chain Hotels (Cronbach's alpha = 0.94, AVE = 0.52), which evaluates in-room elements like lighting, furniture, and accessibility, with factor loadings ranging from 0.44 to 0.63; Customer Experience Management (Cronbach's alpha = 0.95, AVE = 0.63), which

covers aspects like hotel ambiance, entertainment, and service quality, with loadings from 0.35 to 0.72, where entertainment and design have higher contributions; Customer Delight (Cronbach’s alpha = 0.81, AVE = 0.56), assessing emotional responses to hotel services, with loadings between 0.58 and 0.71; and Customer Trust (Cronbach’s alpha = 0.87, AVE = 0.59), which measures staff reliability and sincerity, with loadings from 0.61 to 0.73. The scales are highly reliable, and the AVE values indicate moderate to strong explanatory power, while factor loadings reveal the strength of individual item contributions to their respective constructs.

### Results of developing the causal and outcome factor model for creating a luxury hotel experience in Thailand for senior travelers

The SEM analysis of causal and outcome factors for creating a luxury hotel experience in Thailand for senior travelers was conducted to evaluate the appropriateness and accuracy of the structural equations. The model was adjusted to ensure it met acceptable statistical criteria through variable modification and examination of factor loadings. The results are summarized in Figure 2.

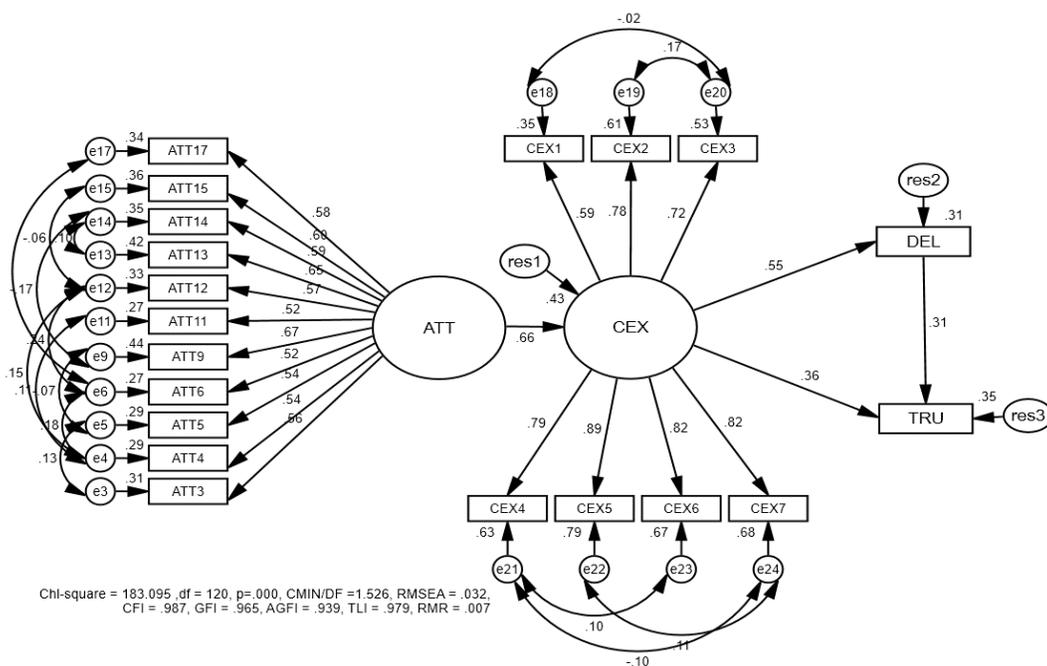


Figure 2 Hypothetical Research Model

From Figure 2, the model of causal and outcome factors for the creation of luxury hotel experiences in Thailand for senior travelers, after modification, demonstrates structural equation modeling that aligns well with empirical data. Analysis reveals the following statistics: Chi-square = 183.095, df = 120, CMIN/DF = 1.526, RMSEA = 0.032, RMR = 0.007, GFI = 0.965, TLI = 0.979. All values meet the set criteria (Hair et al., 2011), indicating that the measurement model is consistent with empirical data and adheres to the hypothesized constructs with statistical support.

The Goodness of Fit Index (GFI) is 0.965 and the Adjusted Goodness of Fit Index (AGFI) is 0.939, both of which exceed the threshold of 0.80. Higher values closer to 1 signify better alignment of the measurement model with empirical data. The Root Mean Square Error of Approximation (RMSEA) is 0.032, which is below the acceptable threshold of 0.05, indicating a good fit of the measurement model to the data. The Chi-square to degrees of freedom ratio (CMIN/DF) is 1.526, which is below the threshold of 2. Based on these indices, it can be concluded that the adjusted structural equation model fits well with the empirical data, and the parameter estimates within this model are acceptable.

**Table 1** Results of the Analysis of Causal and Outcome Factors in the Creation of Hotel Experiences in Thailand for Senior Travelers in Luxury Hotel Chains

Dependent Variables		Independent Variables	$\beta$	b	S.E.	t	P
Attributes of Luxury Chain Hotels (ATT)	--->	Customer Experience Management (CEX)	0.66	0.49	0.06	8.223	0.000***
Customer Experience Management (CEX)	--->	Customer Delight (DEL)	0.56	1.37	0.13	10.394	0.000***
Customer Experience Management (CEX)	--->	Customer Trust (TRU)	0.36	1.07	0.15	7.017	0.000***
Customer Delight (DEL)	--->	Customer Trust (TRU)	0.31	0.37	0.05	6.985	0.000***

\* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001

**Table 2** Parameter Estimates of Direct Effects, Indirect Effects, and Total Effects from the Model

Variable	Customer Experience Management (CEX)			Customer Delight (DEL)			Customer Trust (TRU)		
	DE	IE	TE	DE	IE	TE	DE	IE	TE
	Attributes of Luxury Chain Hotels (ATT)	0.66***		0.66***	-	0.36**	0.36**	-	0.35**
Customer Experience Management (CEX)	-		-	0.56***		0.56***	-	-	0.54***
Customer Delight (DEL)	-		-	-		-	0.31***	-	0.31***

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

From Tables 1 and 2 and Figure 2, it is evident that the adjusted structural equation model of causal factors and outcome factors for creating the experience of staying in luxury hotel chains in Thailand for senior travelers aligns well with empirical data at an acceptable level. This conclusion is based on the model fit indices: Chi-square = 183.095,  $df = 120$ , CMIN/DF = 1.526, RMSEA = 0.032, RMR = 0.007, GFI = 0.965, and TLI = 0.979. The parameter estimates for the structural equation model are as follows:

1. The direct effect (DE) of Attributes of Luxury Chain Hotels (ATT) on Customer Experience Management (CEX) is 0.66 ( $p < 0.001$ ), indicating a strong positive impact.
2. The indirect effect (IE) for ATT through CEX on Customer Delight (DEL) is 0.36 ( $p < 0.01$ ), suggesting that ATT positively influences DEL via CEX.
3. ATT shows an indirect effect of 0.35 ( $p < 0.01$ ) on Customer Trust (TRU), indicating that higher hotel attributes, such as lighting and accessibility, indirectly enhance customer trust.
4. The direct effect of CEX on DEL is 0.56 ( $p < 0.001$ ), and its indirect effect through DEL on TRU is 0.31 ( $p < 0.001$ ), demonstrating that CEX not only directly contributes to customer delight but also indirectly affects trust by fostering a more delightful customer experience.

Overall, the total effects (TE) show the comprehensive impact of each construct, with ATT significantly influencing CEX, DEL, and TRU both directly and indirectly. These findings suggest that improvements in hotel attributes lead to enhanced customer experience, delight, and trust, supporting the value of indirect effects in the model.

## Discussion

The findings of this study provide key insights into the factors shaping luxury hotel experiences for senior travelers in Thailand, focusing on four constructs: Attributes of Luxury Chain Hotels (ATT), Customer Experience Management (CEX), Customer Delight (DEL), and Customer Trust (TRU). All constructs demonstrated strong reliability, with Cronbach's alpha values between 0.81 and 0.95 (Hair et al., 2011). The structural equation model showed excellent fit ( $\chi^2 = 183.095$ , RMSEA = 0.032, GFI = 0.965, TLI = 0.979), meeting recommended standards (Bagozzi & Yi, 2012), confirming that the measurement items effectively captured the underlying dynamics of luxury hotel experiences. Results indicate that luxury hotel attributes significantly influence CEX ( $\beta = 0.66$ ,  $p < 0.001$ ), supporting research emphasizing the importance of accessibility, comfort, and high-quality facilities for senior travelers (S. Kim et al., 2019). Yet, functional attributes alone may not address the evolving expectations of older guests, who increasingly seek immersive, emotionally engaging, and culturally rich experiences (Patrick & Hollenbeck, 2021). Guided by Service-Dominant logic (Vargo & Lusch, 2004), value creation stems not only from tangible offerings but also from co-created interactions, such as personalized service, cultural touchpoints, and digital convenience. CEX strongly enhances both customer delight ( $\beta = 0.56$ ,  $p < 0.001$ ) and trust ( $\beta = 0.36$ ,  $p < 0.001$ ). While effective experiences encourage emotional satisfaction and relational strength, delight often triggered by unexpected positive stimuli may not always align with senior travelers' preference for comfort and predictability (Young et al., 2018). Subtle, meaningful moments of positive surprise are more appropriate than high-intensity novelty (Tomczyk et al., 2022).

The moderate effect of CEX on trust highlights the importance of reliability, professionalism, and safety, which are critical for older guests (Bonfanti et al., 2021). Trust further depends on transparency, ethical conduct, and consistent service (Iglesias et al., 2020), as well as external cues such as brand reputation and online reviews (Cheng et al., 2019). Customer delight

also positively influences trust ( $\beta = 0.31, p < 0.001$ ), reinforcing its role in emotional bonding (Choi & Kandampully, 2019). However, delight must be balanced with consistency to avoid escalating expectations beyond manageable levels (Svotwa et al., 2023), and strategies should be tailored to diverse senior traveler needs (Ahrholdt et al., 2019).

### **Theoretical implications**

This research advances knowledge in customer experience management, hospitality, and aging studies by revealing how personalized service, emotional engagement, and trust shape senior travelers' satisfaction and loyalty in luxury hotels. It highlights the need for cultural immersion, ethical practices, and sustainability while clarifying links between customer delight, trust, and long-term loyalty.

### **Practical implications**

Policy recommendations emphasize improving accessibility, comfort, and personalized in-room services to enhance senior travelers' experiences. Luxury hotels should balance functional upgrades with culturally immersive offerings, while exceptional service strengthens trust in health and safety. Data-driven, adaptable strategies are essential for tailoring services, boosting delight, and fostering long-term loyalty among older guests.

### **Limitations and future research**

This research highlights the need for personalized services, functional comfort, and culturally immersive experiences for older luxury hotel guests. Emotional connections, consistent quality, and sustainability strengthen trust and loyalty. Data-driven personalization is essential. Future research should examine personalized services, loyalty, and the role of AI and IoT across diverse cultural contexts.

### **Declaration of competing interest**

No potential conflict of interest was reported by the author.

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# The Human Resource Analysis of The University Graduates of Thailand in Perspective to the Selected International Companies in Thailand

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## Abstract

The study aims to examine the effectiveness of university graduates' human resources in Thailand in relation to the operational standards of international companies (both Thai-owned and Foreign direct investment firms). And also to evaluate the competencies of Thai graduates in meeting international business standards. The study employed survey research. A sample of 260 respondents from the selected international companies in Pathumtani Thailand who are actively transacting international business marketing operations was used. Multiple regression analysis was conducted to explore the relationship between occupational tasks and the operational standards of international companies. The results revealed that two key factors improvement suggestions and quality circles significantly contributed to aligning with business standards across financial, internal business, customer, and innovation perspectives at the significance level ( $\alpha = 0.01$ ). Developing targeted HRM strategies focused on specific occupational tasks can improve Thai graduates' ability to meet international business requirements. The study offers practical implications for educational institutions and policymakers in aligning academic programs with the needs of the global market.

**Keyword:** International Marketing, Human Resource Management, Innovation, Organizational learning performance, International companies

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## Introduction

The contemporary global business environment is increasingly complex, interconnected, and highly competitive, underscoring the critical need for robust international operational standards. These standards, encompassing quality control, regulatory compliance, and ethical practices, are vital for organizations seeking to maintain competitive advantage and safeguard their reputation in global markets. In this context, the integration of diverse occupational roles becomes essential to achieving organizational efficiency and long-term productivity. The COVID-19 pandemic further highlighted the necessity for operational frameworks that are both standardized and adaptable, particularly for multinational enterprises (Caligiuri et al., 2020).

Within this dynamic landscape, the specificity of occupational tasks and their alignment with strategic organizational objectives play a significant role in determining performance outcomes. Kumar and Zaheer (2023) demonstrated that task specificity and cross-functional integration directly enhance organizational effectiveness in international contexts. This alignment is particularly critical for Thai university graduates, whose competencies must meet global standards to contribute effectively to international business operations. As Thailand positions itself as a regional business hub within ASEAN, the capabilities of its graduates become crucial to supporting national economic growth and global competitiveness.

Human capital remains a decisive factor in the growth and sustainability of international business operations. Farndale et al. (2022) highlighted the importance of continuous learning and internal knowledge sharing, facilitating the spread of up-to-date skills and innovations across global networks. Their longitudinal study of 128 multinational corporations revealed that firms with strong internal knowledge-sharing systems achieved 34% higher operational efficiency. Consequently, Thai graduates must possess not only technical expertise but also adaptive and cross-cultural competencies to thrive in globalized work environments and support Thailand's economic ambitions. Without these essential skills, graduates risk exclusion from high-value international roles, thereby constraining both individual career growth and the country's competitive standing.

Thailand has distinguished itself in producing high-quality consumer goods and integrating human resource capabilities across ASEAN. The country's active regional engagement has made it a significant manufacturing hub, attracting substantial foreign direct investment (FDI). Charoensuk

and Brimble (2022) reported a 28% increase in demand for graduates with international business competencies between 2018 and 2022. While this economic shift presents opportunities, it also highlights persistent skills mismatches threatening Thailand's global value chain position.

Pathum Thani province exemplifies this evolving landscape. Located 27 kilometers from Bangkok, it ranks fourth in industrial performance regionally and eighth nationwide. The Thailand Board of Investment (2023) noted a 17% annual rise in FDI applications from 2020 to 2023. This growth underscores the urgent need for graduates capable of contributing immediately to international corporate environments—a demand that local educational institutions are striving to meet.

This study investigates workplace competency development among Thai university graduates in response to these trends, offering insights for curriculum reform, policy design, and student career planning aligned with global business needs.

## **Theoretical Framework and Literature Review**

This section presents the theoretical underpinnings of our research and reviews relevant literature on the relationship between occupational tasks and international business operations.

### **Conceptualizing Occupational Tasks in International Business**

Occupational tasks refer to the specific activities, duties, and responsibilities that employees perform as part of their job roles within an organization (Hesketh & Neal, 2022). In international settings, these tasks carry additional complexity due to cross-cultural dynamics, global supply chains, and diverse regulatory environments. Sullivan et al. (2023) identified four key categories of occupational tasks in international companies; technical tasks (job-specific skills), cross-cultural tasks (navigating cultural differences), administrative tasks (documentation and compliance), and innovative tasks (problem-solving and improvement).

### **Teamwork and Business Performance**

1) Teamwork and Financial Perspective. Teamwork differs by department within organizations. Veldhoven (2005) reveals that the nature of HR teamwork significantly impacts the financial performance of both individual departments and the entire organization. Tanveer and Singh (2022) extended this understanding by examining how teamwork in multinational settings specifically contributes to financial performance.

Teamwork impacts financial performance, varying by department and influenced by work climate and HR practices. Diverse, cross-functional teams in international settings significantly boost revenue growth.

H1: Occupational tasks positively influence the financial performance standards of international companies' business operations.

2) Teamwork and Internal Business Perspective. The collaborative spirit within departments significantly affects an organization's Internal Business Perspective, Khanna and Lee (2023) investigated how teamwork contributes to internal business processes in international manufacturing companies.

Teamwork greatly impacts a company's Internal Business Perspective. Diverse teams, especially in international settings, enhance efficiency by using organizational guidelines and technology, leading to reduced operational costs.

H2: Occupational tasks positively influence the internal business process standards of international companies' business operations.

3) Teamwork and Customer Perspective. Brockbank (1999) revealed the importance of HR in executing team tasks within organizations. The effectiveness of team efforts reflects in customer perceptions of the entire organization. More recent research by Pattnaik and Sahoo (2021) examined how teamwork in customer-facing roles influences customer satisfaction in multinational corporations.

HR's role in teamwork boosts customer satisfaction. Studies show diverse, cross-functional teams with local cultural knowledge in international settings significantly improve customer perceptions and service quality.

H3: Occupational tasks positively influence the customer satisfaction standards of international companies' business operations.

4) Teamwork and Innovation and Organizational Learning Performance. Research by Techakosol and Zhang (2024) expanded on this relationship by examining how teamwork contributes to innovation in multinational technology companies.

Modern tech boosts team performance and efficiency. Diverse teams, especially in multinational tech companies, drive significantly more innovation, highlighting the value of collaborative Thai graduates.

H4: Occupational tasks positively influence the innovation and organizational learning standards of international companies' business operations.

### **Personal/Self-Discipline and Business Performance**

Personal or self-discipline developed in academic settings translates directly to workplace performance, impacting multiple business dimensions. Zablah (2004) argued that Customer Relationship Management (CRM) is not solely a technological tool but integrates human discipline, contributing to stronger financial outcomes. Regarding internal business processes, Bennett et al. (2010) and Welzel (2003) emphasized that academic discipline enhances work quality, forming a foundation for internal efficiency. From a customer perspective, Porter and Millar (2001) noted that information systems, driven by disciplined HR practices, improve supply chain communication and marketing responsiveness. Greve (2003) highlighted how disciplined HR representatives utilize technology for organizational learning, driving innovation and improving customer feedback systems. Together, these studies suggest that self-discipline is crucial for aligning individual performance with strategic business goals, ultimately boosting financial results, internal operational standards, customer satisfaction, and continuous learning capacities within international companies.

### **Improved Morale and Business Performance**

Improved morale among employees plays a vital role across business performance perspectives. Manongi et al. (2006) showed that employee benefits enhance morale, driving financial outcomes and productivity. Phongpaichit and Henderson (2023) expanded this link to international firms in Thailand, emphasizing morale's financial significance. Internally, continuous learning initiatives not only boost skills but also uplift morale, leading to more effective and confident task completion (Heisler & Lasher, 2007). From a customer standpoint, Shaw (2005) revealed that morale-driven CRM system use enhances communication and customer satisfaction, aligning with customer expectations of HR service. Finally, Cummings and Zee (2005) described how strong social interactions, facilitated by robust internet infrastructure, enable dynamic exchanges between employees and customers, fostering innovation and learning. Overall, high morale strengthens operational consistency, customer relations, and adaptability, vital for international competitiveness.

### **Quality Circles and Business Performance**

Quality circles have evolved from Japan's manufacturing focus to global applications tackling service quality, digital transformation, and sustainability (Nakamura & Anderson, 2023). Financially, quality circles reduce costs, enhance quality allowing for premium pricing, and minimize waste (Sirisumphun & Parkhe, 2023). Internally, they improve business processes and promote collaborative efficiency in multinational ASEAN firms (Limpaphayom & Zhang, 2022). For customer perspectives, Dhonburi and Nandakumar (2023) found that quality circles close service gaps not identified through traditional feedback. In terms of innovation and learning, Smits (2002) demonstrated that quality circles create structured spaces for knowledge sharing and problem-solving, supporting continuous improvement. Globally, these circles are now pivotal for organizational agility and long-term competitiveness.

### **Improvement Suggestions and Business Performance**

Improvement suggestions, conceptualized as proactive employee behaviors, play a crucial role in enhancing organizational innovation, efficiency, and adaptability (Jain & Merikas, 2023). In multinational contexts, these suggestions leverage diverse perspectives, boosting global competitiveness. Thammasat and Rodriguez (2023) found they significantly improve financial performance through efficiency and quality enhancements. Jirapanthong and Srivastava (2022) showed they strengthen internal processes, while Panich and Kumar (2023) linked them to higher customer satisfaction. Finally, Tantivess and Barkema (2024) highlighted their role in fostering innovation and organizational learning. Together, these findings emphasize improvement suggestions as strategic drivers of comprehensive business performance across contexts.

### **Theoretical Framework and Research Gaps**

This study proposes an integrated framework linking five occupational tasks (teamwork, self-discipline, morale, quality circles, and improvement suggestions) to four business performance dimensions (financial, internal business, customer, and innovation perspectives). Grounded in Knowledge-Based View and Social Exchange Theory, it highlights Thai graduates as rare, valuable resources in ASEAN business contexts. The occupational tasks function as organizational capabilities transforming human resources into firm-specific, inimitable performance advantages. Integrating these tasks creates synergistic effects beyond individual contributions. Emphasizing Thailand and ASEAN, the study underscores how resource value depends on

geographic and cultural contexts, reinforcing the importance of context-specific competitive advantages for sustained success.

### Expected Relationships and Theoretical Justification

Drawing from the literature review, this study proposes key relationships between occupational tasks and business operational standards as the basis for its hypotheses. Quality circles are expected to enhance financial performance through improved problem-solving, cost reduction, and process optimization, supported by collaborative knowledge sharing that strengthens intellectual capital (Bontis, 1999; Rodrik, 2000; Sirisumphun & Parkhe, 2023). Improvement suggestions are anticipated to strongly predict innovation outcomes, as employee-driven ideas often reveal process and product development opportunities overlooked by top-down approaches (Yi-jun & Cui-jie, 2011; Tantivess & Barkema, 2024). Effective teamwork, particularly in cross-cultural settings, is expected to boost customer satisfaction and loyalty by enabling teams to better understand and meet diverse needs (Brockbank, 1999; Pattnaik & Sahoo, 2021). Self-discipline is projected to improve internal business processes through consistent adherence to standards and attention to detail (Bennett et al., 2010). Improved morale is expected to positively influence all operational perspectives, especially innovation and internal processes (Martinez & Martineau, 1998; Phongpaichit & Henderson, 2023). This study uniquely contributes by empirically testing these relationships among Thai graduates in international companies in Pathum Thani, offering valuable theoretical insights and practical recommendations for curriculum design and organizational strategies to enhance global business performance.

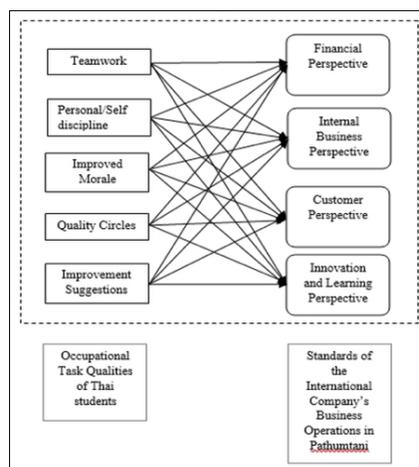


Figure 1 Conceptual Framework

Drawing from the literature review, the research objectives and hypotheses are formulated to investigate the influence of occupational tasks on the operational standards of international companies. The study seeks to identify the extent to which occupational tasks contribute to the consistency and effectiveness of these standards in an international context.

### **Research Objectives**

To investigate the occupational task influences standards of the international company's business operations

### **Research Methodology**

#### **Research Design and Sampling**

This study used a quantitative survey design targeting HR representatives from international companies in Pathum Thani, Thailand, including both Thai-owned and foreign-owned firms. Simple random sampling ensured equal selection chances, minimizing bias and enhancing representativeness (Creswell & Creswell, 2023). Using G\*Power software with an effect size of 0.15,  $\alpha = 0.05$ , power = 0.95, and 13 predictors, a minimum sample of 189 was calculated. To strengthen reliability, the sample was increased to 260 respondents.

#### **Data Collection and Instrument**

Data were collected using a structured, expert-validated questionnaire covering demographics, occupational task qualities (e.g., teamwork, self-discipline), and operational standards (e.g., financial, customer perspectives). Items were measured on a 5-point Likert scale.

#### **Data Analysis Techniques**

SPSS version 22 was used for analysis. Descriptive statistics examined sample characteristics, reliability analysis assessed measurement consistency, and multiple regression analysis tested the hypotheses linking tasks to performance outcomes.

### **Results and Discussion**

The regression analysis revealed positive coefficients, indicating a positive relationship between Thai students' occupational tasks and the operational standards of international companies.

**Table 1** Analysis of Variance

	Sum of square	df	Mean square	F	Sig
Regression	3330.86	3	1110.286	5.834	0.000
Residual	8944.35	47	190.305		
Total	12275.21	48			

From table 1, the model explains a significant portion of the variance in the dependent variable, as indicated by the low p-value (0.000). The F-statistic is quite high (36.77), reinforcing that the model has a good fit. The mean square values show that most of the variation is captured by the regression model compared to the residual (error).

**Table 2** The coefficient of the relationship between the occupational task influences standards of the international company’s business operations in terms of financial perspective.

Model	Unstandardized		Standardized	t	Sig.	VIF
	Coefficients		Coefficients			
	B	Std. Error	Beta			
(Constant)	6.923	0.757		9.151	0.000*	
improvement suggestions	0.496	0.053	0.03	9.344	0.000*	3.441
(Constant)	5.66	0.848	0.749	6.678	0.000*	
improvement suggestions	0.309	0.08	0.313	3.884	0.000*	6.123
quality circles	0.269	0.086	0.251	3.113	0.002*	8.962
<b>R = 0.943 R<sup>2</sup> = 0.889 Adjusted R<sup>2</sup> = 0.888 SE<sub>Est</sub> = 0.28691 F = 63.923 p = .000</b>						

From Table 2, only improvement suggestions and quality circles significantly contribute to the model based on p-values. Improvement suggestions ( $\beta = .503$ ,  $t = 9.34$ ,  $p = .000$ ) show a strong positive relationship with the financial business perspective, indicating that higher application of these suggestions enhances financial standards in international operations. Similarly, quality circles ( $\beta = .251$ ,  $t = 3.11$ ,  $p = .002$ ) positively relate to financial perspectives, suggesting that emphasizing quality circles in Thai students’ occupational tasks supports better alignment with financial performance standards in international company operations.

**Table 3** Analysis of Variance

	Sum of square	df	Mean square	F	Sig
Regression	6754.89	9	750.543	2.962	0.000
Residual	8867.32	35	253.35		
Total	15622.21	42			

From table 3, the model explains a significant portion of the variance in the dependent variable, as indicated by the low p-value (0.000). The F-statistic is quite high (2.962), reinforcing that the model has a good fit. The mean square values show that most of the variation is captured by the regression model compared to the residual (error).

**Table 4** The coefficient of the relationship between the occupational task influences standards of the international company’s business operations internal business perspective.

Model	Unstandardized		Standardized	t	Sig.	VIF
	Coefficients		Coefficients			
	B	Std. Error	Beta			
(Constant)	6.766	0.65		10.412	0.000*	
improvement suggestions	0.515	0.046	0.575	11.294	0.000*	5.122
(Constant)	5.507	0.723		7.615	0.000*	
improvement suggestions	0.329	0.068	0.367	4.840	0.000*	3.451
quality circles	0.268	0.074	0.276	3.635	0.000*	7.111
<b>R = 0.644 R<sup>2</sup> = 0.762 Adjusted R<sup>2</sup> = 0.788 SE<sub>Est</sub> = 0.3122 F = 48.239 p = .000</b>						

Table 4 shows that improvement suggestions ( $\beta = .575$ ,  $t = 11.29$ ,  $p = .000$ ) have a strong positive relationship with the international business perspective, indicating that greater use of these suggestions helps meet international operational standards. Similarly, quality circles ( $\beta = .276$ ,  $t = 3.63$ ,  $p = .000$ ) positively influence this perspective, suggesting their increased application supports stronger alignment with international standards. Additionally, Table 3 highlights that occupational tasks also significantly influence the customer perspective of international business

operations, emphasizing the importance of task-focused development in meeting diverse performance standards.

**Table 5** Analysis of Variance

	Sum of square	df	Mean square	F	Sig.
Regression	2155.66	7	307.951	1.33	0.000
Residual	5093.45	22	231.52		
Total	7249.11	38			

The model explains a significant portion of the variance in the dependent variable, as indicated by the low p-value (0.000). The F-statistic is quite high (1.33), reinforcing that the model has a good fit. The mean square values show that most of the variation is captured by the regression model compared to the residual (error).

**Table 6** the coefficient of the relationship between the occupational task influences standards of the international company’s business operations customer perspective.

Model	Unstandardized		Standardized	t	Sig.	VIF
	Coefficients		Coefficients			
	B	Std. Error	Beta			
(Constant)	5.903	0.73		8.085	0.000*	
improvement suggestions	0.564	0.051	0.565	11.003	0.000*	7.667
(Constant)	4.307	0.807		5.337	0.000*	
improvement suggestions	0.328	0.076	0.328	4.322	0.000*	4.998
quality circles	0.34	0.082	0.314	4.132	0.000*	7.111
<b>R = 0.876 R<sup>2</sup>= 0.662 Adjusted R<sup>2</sup> = 0.881 SE<sub>Est</sub> = 0.223 F = 44.556 p = .000</b>						

Table 6 shows that improvement suggestions ( $\beta = .565$ ,  $t = 11.003$ ,  $p = .000$ ) strongly and positively relate to the customer perspective, suggesting that greater use of these suggestions helps meet customer standards in international operations. Similarly, quality circles ( $\beta = .314$ ,  $t = 4.13$ ,  $p = .000$ ) also have a positive impact, indicating their importance in aligning with customer expectations. Moreover, increased implementation of improvement suggestions further supports

achieving innovation and organizational learning performance standards, highlighting their critical role in enhancing overall business effectiveness in international contexts.

**Table 7** Analysis of Variance

	Sum of square	df	Mean square	F	Sig.
Regression	4671.23	5	934.246	3.446	0.000
Residual	8944.35	33	271.04		
Total	13615.58	37			

From Table 7, the model explains a significant portion of the variance in the dependent variable, as indicated by the low p-value (0.000). The F-statistic is quite high (3.446), reinforcing that the model has a good fit. The mean square values show that most of the variation is captured by the regression model compared to the residual (error).

**Table 8** the coefficient of the relationship between the occupational task influences standards of the international company’s business operations in terms of Innovation and organizational learning performance.

Model	Unstandardized		Standardized	t	Sig.	VIF
	Coefficients		Coefficients			
	B	Std. Error	Beta			
(Constant)	6.766	0.65		10.412	0.000*	
improvement suggestions	0.515	0.046	0.575	11.294	0.000*	5.122
(Constant)	5.507	0.723		7.615	0.000*	
improvement suggestions	0.329	0.068	0.367	4.840	0.000*	3.451
quality circles	0.268	0.074	0.276	3.635	0.000*	7.111
<b>R = 0.551 R<sup>2</sup>= 0.823 Adjusted R<sup>2</sup> = 0.891 SE<sub>Est</sub> = 0.478 F = 59.336 p = .000</b>						

Table 8 indicates that the t-values for the coefficients of Improvement Suggestions and Quality Circle are statistically significant. Specifically, Improvement Suggestions ( $\beta = .611$ ,  $t = 12.406$ ,  $p = .000$ ) and \*Quality Circle\* ( $\beta = .254$ ,  $t = 3.45$ ,  $p = .000$ ) both demonstrate positive relationships with the Innovation and organizational learning performance. This suggests that as

the application of improvement suggestions and quality circles in the occupational tasks of Thai students increases, the Innovation and organizational learning performance standards of the international company's business operations are more likely to be achieved.

## Discussion

### Interpretation of Findings

This study reveals that among the five occupational task qualities examined—teamwork, personal/self-discipline, improved morale, quality circles, and improvement suggestions—only quality circles and improvement suggestions showed statistically significant relationships with operational standards across all four perspectives: financial, internal business, customer, and innovation and learning. This suggests that Thai university graduates' ability to actively engage in quality circles and provide improvement suggestions is highly valued in international business environments. Their strong positive relationships with all operational perspectives emphasize their importance for meeting international standards.

### Quality Circles and Business Operations

The significant impact of quality circles aligns with Schedler and Felix (2019), who found that quality circles enhance teamwork and enable strategic business units to benefit from continuous quality improvements. These circles create structured environments for cross-functional collaboration, problem-solving, and knowledge sharing, contributing directly to business performance. Czinkota et al. (2021) further support this by noting that regular quality circle meetings improve time efficiency and product quality. Chen and Chen (2020) also highlight that quality circles foster effective knowledge management, facilitating innovation and continuous improvement through collaborative idea exchange.

### Improvement Suggestions and Business Operations

The strong relationship between improvement suggestions and business operations aligns with Gordon et al. (2023), who concluded that employee suggestions enhance product quality and overall performance. This skill demonstrates graduates' critical thinking and understanding of organizational processes, which are vital for international roles. Yi-jun and Cui-jie (2019) similarly emphasized the role of suggestions in technological innovation and problem-solving, supporting our findings that improvement suggestions significantly contribute to

innovation and organizational learning performance. The consistent significance across all perspectives highlights the versatility and value of this competency in various operational areas, offering important implications for curriculum development and talent management strategies.

### **Comparison with Previous Studies**

These findings support and extend earlier research on human capital's role in business performance. While studies by Bontis (2023) and Premuroso and Houmes (2021) focused broadly on intellectual capital and human resource development, this study specifically identifies quality circles and improvement suggestions as critical to meeting international standards. This provides a more targeted framework for developing competencies in Thai graduates. Interestingly, unlike studies emphasizing teamwork (Veldhoven, 2018; Jackson et al., 2020), this study suggests that for Thai graduates in international contexts, participating in quality circles and offering improvement suggestions are more directly linked to success in global operations, signaling a shift in skill development priorities.

### **Limitations and Future Research**

This study has several limitations. First, its cross-sectional design captures data at a single point, limiting causal inferences about the relationship between occupational tasks and international business standards. Longitudinal studies would allow researchers to observe skill development and its long-term effects. Second, reliance on self-reported data introduces potential biases such as social desirability and common method variance; future studies could use supervisor assessments or objective performance metrics to strengthen validity. Third, focusing only on international companies in Pathum Thani limits generalizability to other regions or cultural contexts. Comparative studies across different Thai provinces or other ASEAN countries could reveal contextual differences. Additionally, the study examined only five occupational task qualities, omitting other potentially critical skills like cross-cultural competence, digital literacy, and language proficiency. Future research could integrate these variables to provide a more comprehensive understanding of competencies needed in international business.

Future studies might also compare the importance of occupational tasks across various industries such as manufacturing, services, or technology. Experimental research could evaluate the effectiveness of educational programs designed to strengthen quality circle participation and

improvement suggestion skills among students. Furthermore, tracking graduates from university into early careers could offer valuable insights into how these competencies evolve and impact professional success.

### Implications

Theoretically, this study contributes to human capital literature by identifying quality circle participation and improvement suggestions as key competencies for international organizational success, especially within emerging economies like Thailand. Empirically demonstrating these relationships advances understanding of which specific skills help Thai graduates thrive in multinational contexts.

Practically, the findings provide clear guidance for universities, employers, policymakers, and graduates. Universities should integrate these skills into curricula through problem-based learning, case studies, and experiential projects. International companies should assess these competencies during recruitment and offer targeted training. Policymakers can support these initiatives by promoting industry-academia partnerships, internships, and skill-focused educational reforms. Graduates should actively develop these abilities through coursework, extracurricular activities, and practical experiences to enhance employability.

### Conclusion

As Thailand positions itself as a regional business hub within ASEAN, developing graduates with internationally aligned competencies is vital. Focusing on quality circle participation and improvement suggestions can help bridge the 35% skills gap between university training and industry needs. Strengthening these competencies will support individual career growth and enhance Thailand's global competitiveness. Coordinated efforts among universities, companies, policymakers, and graduates are essential to create a workforce capable of meeting and exceeding international business standards.

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## Leveraging Virtual Influencer Attractiveness to Green Purchase Intentions in Sustainable Fashion

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### Abstract

Technological advancements have significantly impacted modern marketing strategies, with virtual influencers gaining increasing popularity. This study aims to examine the influence of virtual influencers' attractiveness on consumers' green purchase intentions, considering the mediating roles of attitude and brand engagement. A survey was conducted using a sample of 440 Thai consumers aged 18 and above, and the data were analyzed using the PROCESS Macro to explore the relationships between the variables. The results indicate that both attitude and brand engagement fully mediate the relationship between virtual influencers' attractiveness and green purchase intention in a serial manner. However, the attractiveness of virtual influencers does not have a direct effect on purchase intention. The study highlights how the attractiveness of virtual influencers can enhance consumers' positive green attitudes and increase brand engagement, ultimately leading to a higher green purchase intention. The findings contribute to the development of marketing strategies that utilize technology in sustainability businesses and expand the understanding of virtual influencer effects under the Stimulus-Organism-Response (S-O-R) theory.

**Keywords:** Virtual influencer, Green purchase intention, Brand engagement, Green attitude, Serial mediation

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## Introduction

Technology significantly influences the modern advertising model, playing a crucial role that is impossible to ignore. The initial phase was defined by the emergence of Marketing 4.0, an approach that places emphasis on digital and social media marketing. Subsequently, this evolved into Marketing 5.0, which places an intense focus on data and personalization as well as marketing technology (Kotler, Kartajaya, & Setiawan, 2021). Presently, we are transitioning into the phase of Marketing 6.0 (Metaverse), whereby the intent is to construct a simulated realm using AR (augmented reality) and VR (virtual reality) technology to offer novel encounters for consumers (Dwivedi et al., 2022). Moreover, it raises challenges for marketers to develop efficient marketing communication approaches to effectively target consumers (Miao, Kozlenkova, Wang, Xie, & Palmatier, 2022).

Simultaneously, technological advances have given rise to notable innovations such as intelligent and rapidly learning artificial intelligence (AI). In marketing, AI has been instrumental in numerous areas. This study examines the use of AI to create virtual personalities (Avatars) as a communication strategy through social communication media. These virtual personalities, or virtual influencers, are utilized in the presentation or endorsement of products, exerting a persuasive influence on their audience (Franke, Gröppel-Klein, & Müller, 2023; Mustak, Salminen, Plé, & Wirtz, 2021).

Virtual influencers have been well-received by consumers and are gaining attention from both national and international business organizations (Conti, Gathani, & Tricomi, 2022; Hugh Wilkie, Dolan, Harrigan, & Gray, 2022), especially in the rapidly expanding Southeast Asia region of the marketing communications industry (Chaihanchai, Anantachart, & Ruangthanakorn, 2024). In Thailand, a virtual influencer named Ai-Ailynn has been introduced as the brand ambassador of Advanced Info Service Public Company Limited, reflecting the growing trend of Virtual Influencer Marketing in the country (Advanced Info Service Public Company [AIS], 2021). This phenomenon has garnered significant interest from modern consumers, who are already familiar with virtual characters from video games and animations. The advantages of virtual influencers include their immunity to emotions, aging, or illness, as well as their ability to control the brand's image and personality at all times. In this study, virtual influencers serve as theoretical stimulators of

stimulus-organ response, influencing internal processes such as consumer attitude and leading to various forms of brand engagement and purchase intention.

Previous studies have clearly demonstrated that influencers, as content creators, play a significant role in influencing the interests of large numbers of consumers on online platforms (Chaihanchai et al., 2024; Leung, Gu, & Palmatier, 2022). However, due to technological advancements, a new form of influencer marketing has emerged, known as virtual influencers. This study seeks to examine the influence of virtual influencers on consumers' purchase intentions, specifically focusing on sustainable fashion businesses. The objective is to develop digital marketing strategies that promote environmental sustainability and social responsibility, thereby enhancing the competitiveness of businesses that prioritize these values. The increasing severity of global climate change has significant repercussions for the global population. Since the fast fashion industry is a primary source of greenhouse gas emissions, accounting for 10% of annual global emissions and producing approximately 20% of wastewater (World Bank, 2019), it is crucial to support the sustainable fashion sector and raise consumer awareness.

Advocating for environmental sustainability in the sustainable fashion or eco-fashion business is a highly impactful approach to mitigating environmental issues. This includes promoting ideas that facilitate the shift of fashion items towards ecological equilibrium and social fairness. Sustainable fashion encompasses not only the selection of textiles or materials for fashion products but also the production methods and the lifespan of the goods, with the objective of fostering a healthy environment and advancing global equilibrium. Based on research, urban consumers demonstrate a higher propensity to endorse sustainable fashion, indicating favorable prospects for eco-friendly fashion enterprises (Olwoch, Sonnenberg, Reis, & Taljaard-Swart, 2023).

Despite the growing prominence of virtual influencers in contemporary marketing practices, there is limited research examining their impact on green purchase intentions, particularly within sustainable fashion enterprises. While existing literature has explored influencer marketing and consumer engagement, the specific role of virtual influencers in shaping sustainable consumer behavior remains under-explored. Furthermore, the mediating effects of attitude toward green products (ATGP) and brand engagement (BEGM), as analyzed using the PROCESS macro recommended by Hayes (2018), in this relationship require further investigation. Given the

increasing integration of virtual influencers within the Thai market, this study seeks to address these gaps by employing the Stimulus-Organism-Response (S-O-R) framework to assess their influence on sustainable fashion consumption, thereby contributing to a deeper understanding of this emerging trend. By utilizing the problematization method, we have identified the research question.

Research question 1: How do VIAT, ATGP, BEGM, and GPIT influence each other among Thai consumers?

Research question 2: How do ATGP and BEGM mediate the interaction between VIAT and GPIT?

This paper contains a presentation consisting of a total of 5 sections: (1) introduction, (2) theory and hypotheses development, (3) research method, (4) analysis and results, (5) conclusion and discussion and, (6) limitations, implications, and future research.

## Literature Review

Theory of stimulus-organism-response and the virtual influencer attractiveness-attitude-brand engagement-intention gap in green advertisement

The Stimulus-Organism-Response (S-O-R) Theory is a psychological framework for understanding human behavior, particularly in marketing and consumerism. Thorndike (1911) demonstrated that behaviors followed by positive outcomes tend to be repeated, whereas those with negative consequences are abandoned. Initially, the Stimulus-Response (S-R) Theory focused solely on observable behavior, disregarding internal cognitive processes. Watson (1913) emphasized the scientific study of measurable actions, while Skinner (1938) established that behavior is shaped by reinforcement and its consequences.

As the theory evolved, researchers recognized that responses to stimuli involve internal cognitive processing. This led to the incorporation of the organism (O) as a mediating factor in behavioral responses. Tolman (1932) and Lewin (1951) contributed by highlighting cognitive and environmental influences, giving rise to the S-O-R framework, which comprises (1) stimulus, external factors influencing consumer behavior, (2) organism—internal cognitive processes shaping perception and evaluation, and (3) response—observable behavior.

Mehrabian and Russell (1974) further refined the model by identifying three cognitive responses to stimuli: (1) Pleasure—subjective experience of stimuli, (2) Arousal—degree of alertness induced, and (3) Dominance—perceived control over the environment. Both external and internal stimuli can trigger these responses (Sugiarto et al., 2022).

This study employs the S-O-R Theory as a foundational framework for examining consumer behavior in green marketing. In this model, virtual influencer attractiveness (VIAT) serves as the stimulus (S)—an external factor that influences consumer perceptions. This stimulus triggers cognitive and emotional processes within consumers (the organism (O)), shaping their attitude toward green products (ATGP) (Bi & Zhang, 2023; Pick, 2021). These internal responses subsequently translate into observable behaviors (the response (R)), manifesting as brand engagement (BEGM) (Zheng & Xu, 2024) and green purchase intention (GPIT) (Bi & Zhang, 2023; Koay, Cheung, Soh, & Teoh, 2022; Pick, 2021; Zheng & Xu, 2024).

By applying the S-O-R framework, this study explores how consumers' psychological responses to virtual influencers in the sustainable fashion industry influence their engagement with brands and intent to purchase green products. The proposed research model (Figure 1) systematically examines these relationships, leading to the formulation of the following study hypotheses.

Hypothesis 1: VIAT has a significant positive effect on ATGP,

Hypothesis 2: VIAT has a significant positive effect on BEGM,

Hypothesis 3: VIAT has a significant positive effect on GPIT.

Additionally, previous studies suggest that other variables, specifically ATGP (Bi & Zhang, 2023; Duong, 2022; Kumar, 2024; Rūtelionė & Bhutto, 2024) and BEGM (Amankona, Yi, & Kampamba, 2024; Duffett & Maraule, 2024; Hanaysha, 2022; Zheng & Xu, 2024), also influence GPIT. Specifically, ATGP shapes consumers' perceptions and attitudes toward green products, which in turn impacts their intention to purchase such products. Moreover, ATGP has been shown to exert a significant influence on BEGM, as a positive attitude toward green products often leads to greater consumer engagement with sustainable brands (Park, 2022). Based on these relationships, it can be hypothesized that:

Hypothesis 4: ATGP has a significant positive effect on BEGM,

Hypothesis 5: ATGP has a significant positive effect on GPIT,

Hypothesis 6: BEGM has a significant positive effect on GPIT.

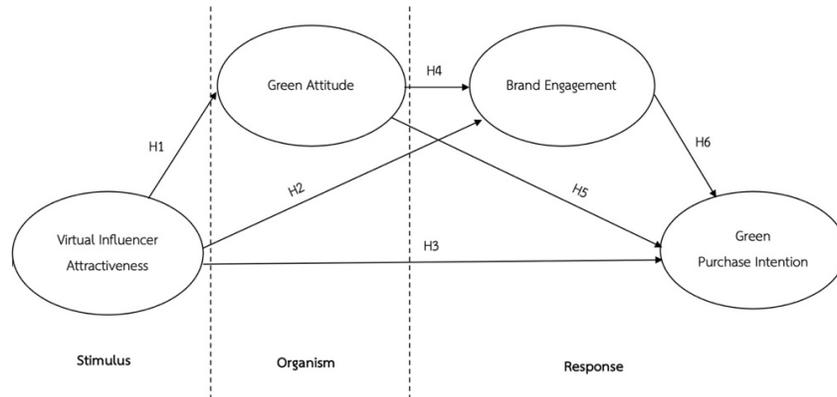


Figure 1 Research Framework

### Mediation of green attitude and brand engagement

In the association between VIAT and GPIT, ATGP acts as a mediator variable. The researchers conducted a literature review of a prior study conducted by Bi and Zhang (2023). The study revealed that attitude towards a product acted as a mediator in the connection between parasocial relationships and purchase intention. A study conducted by Kumar (2024) discovered that attitude acted as a mediator in the connection between purchase intention and three other factors: ethical obligation, environmental concern, and subjective norms.

The findings of Rūtelionė and Bhutto (2024) align with our study, which investigated the mediation effect of attitude on association between purchase intention and three other variables: utilitarian environmental benefits, warm glow benefits, and self-expressive benefits. This suggests that ATGP may act as a mediator in the relationship between VIAT and GPIT in the context of sustainable fashion businesses. Therefore, the study's hypotheses can be expressed as follows:

Hypothesis 7: ATGP mediates the relationship between VIAT and GPIT.

The investigators examined the role of the BEGM mediator in the relationship between VIAT and GPIT. We had a literature review from a previous study by Amankona et al. (2024) that investigated the role of the mediation variable of engagement in the relationship between digital

social responsibility and purchase intention, as well as Ismail, Elsharnouby, and Abd Elaal (2024) that found that engagement had a moderation effect in the relationship between sector reputation and purchase intention. Consequently, we may formulate the following study hypotheses:

Hypothesis 8: BEGM mediates the relationship between VIAT and GPIT.

### **The attitude towards green products and brand engagement as a serial mediator**

The serial mediating variables of ATGP and BEGM play a crucial role in the correlation between VIAT and GPIT. We have reviewed previous literature from the study by Zheng and Xu (2024) on the serial mediation of emotional attachment and social media engagement in the relationship between attractive appearance and purchase intention. It can be observed that there are variables in the hierarchical order that are consistent with this study, including social media engagement, attractive appearance, and purchase intention. Therefore, there is a tendency to align with the hypothesis of this study.

Similarly to Ismail et al. (2024), this study examines the mediating role of engagement and attitude in the relationship between sector reputation and purchase intention. The study observes the following sequence for the mediating variables: Sector Reputation → Sector Engagement → Attitude toward Sector → Purchasing Stock Intention. In this research, the sequence of the mediating variables is as follows: Virtual influencer attractiveness → Attitude toward green products → Brand engagement → Green purchase intention. Nonetheless, the sequence of these variables tends to link to our study's hypothesis:

Hypothesis 9: ATGP and BEGM serially mediate the relationship between VIAT and GPIT.

## **Methodology**

### **Sample procedures and data collection**

The population in this study consists of consumers aged over 18 years in Thailand. However, the exact population size is unknown. The sample size of 440 cases was determined based on the recommendation by Joe F. Hair, Sarstedt, Ringle, and Mena (2012) for structural equation modeling (SEM). SEM analysis requires a sample size that is 10–20 times the number of observed variables. With four latent variables and 22 observed variables in this study, the

recommended sample size falls between 220-440. Therefore, a sample size of 440 was chosen, which is considered sufficient for reliable SEM analysis.

A structured questionnaire was designed for data collection, consisting of 22 observed variables aimed at assessing consumers' knowledge, attitudes, and purchase intentions regarding eco-friendly products. The questionnaire employed a Likert scale, with responses ranging from "Strongly Agree" to "Strongly Disagree," to measure participants' attitudes and behaviors. The survey was conducted over a one-month period, from April 10<sup>th</sup> to May 10<sup>th</sup>, 2024. A nonprobability sampling technique was utilized in this study, meaning that the probability of each unit being selected is unknown. Although the lack of random sampling may limit the generalizability of the findings, this approach was chosen to ensure a sample representative of diverse regions across Thailand.

The sampling process employed a multi-stage sampling method, the first stage involved selecting sample groups at the regional level. Thailand is divided into six regions, each distinguished by unique geographical and cultural characteristics: northern, northeastern, central, eastern, western, and southern. To ensure representative coverage across regions, purposive sampling was employed to select the most densely populated province from each region. The provinces selected were Chiang Mai (Northern), Nakhon Ratchasima (northeastern), Bangkok (Central), Chonburi (Eastern), Nakhon Pathom (Western), and Songkhla (Southern).

In the second stage, data collection within each province was conducted using quota sampling. A total of 440 samples were collected: 74 from both Bangkok and Nakhon Ratchasima, and 73 from each of the remaining provinces: Chiang Mai, Chonburi, Nakhon Pathom, and Songkhla. The third stage involved trained teams utilizing the intercept method to gather data from participants.

The data collected was analyzed using SPSS for descriptive statistics and PROCESS Macro for mediation and moderation analysis. PROCESS Macro was specifically chosen due to its ability to handle complex models involving mediators and moderators, which aligns with the objectives of this study. SPSS was used for initial data cleaning and checking for missing values.

### **Measures**

The study's constructs have been derived from prior research and modified to be applicable to the context for the purpose of assessing four latent variables; virtual influencer

attractiveness (VIAT) from Wiedmann and von Mettenheim (2021), Bi and Zhang (2023), Zheng and Xu (2024), and McCracken (1989); attitude towards green products (ATGP) from Chanda, Isa, and Ahmed (2023) and Duong (2024); brand engagement (BEGM) from Zaichkowsky (1985), Cheung, Pires, and Rosenberger Iii (2021), Riskos, Dekoulou, Hatzithomas, and Papisolomou (2024), and Haverila, Haverila, McLaughlin, Rangarajan, and Currie (2024); green purchase intention (GPIT) from Chanda et al. (2023), Zheng and Xu (2024), and Duong (2024).

## Results and discussion

### Descriptive statistics and multicollinearity

The demographic characteristics of the participants in this study, consisting of 440 respondents, are summarized in Table 1. The sample includes a diverse distribution in terms of gender, age, education, and monthly income. Specifically, 77.8% of the participants are female, while 22.5% are male. Regarding age, the majority (60.7%) fall within the 18-26 age group, followed by 19.1% in the 27-44 age range. In terms of educational background, 62.7% of respondents have education below a bachelor's degree, while 34.8% hold a bachelor's degree, and 2.5% have higher qualifications. The income distribution shows that 64.5% of participants earn below 10,000 THB per month, with progressively fewer participants earning higher amounts. These demographic details are crucial for understanding the context of the research and ensuring that the sample is representative of the target population. As shown in Table 2, there is no issue of multicollinearity, indicating that the correlations between the variables are below the threshold of 0.80, which ensures the validity of subsequent analyses (Gujarati & Porter, 2009).

**Table 1** Demographic data of the participants ( $N = 440$ )

Variable		F	%	CF
Gender	Male	99	22.5	22.5
	Female	341	77.8	100.0
Age	18-26 years	267	60.7	60.7
	27-44 years	84	19.1	79.8
	45-59 years	59	13.4	93.2
	60 years and above	30	6.8	100.0
Education	Below bachelor's degree	276	62.7	62.7
	Bachelor's degree	153	34.8	97.5

**Table 1** Demographic data of the participants ( $N = 440$ ) (Continued)

Variable		F	%	CF
Education (continued)	Above bachelor's degree	11	2.5	100.0
Monthly income (in Thai baht)	Below 10,000 baht	284	64.5	64.5
	10,001-19,999 baht	67	15.2	79.8
	20,000-29,999 baht	33	7.5	87.3
	30,000-39,999 baht	22	5.0	92.3
	40,000 baht and above	34	7.7	100.0

**Note:** 1 USD = 36.74 THB (exchange rate on April 10, 2024)

### Measurement model and confirmatory factor analysis (CFA)

The study employed SPSS 29.0.2.0 (20) and AMOS 18 software to conduct confirmatory factor analysis. Additionally, Cronbach's alpha was utilized to assess the consistency and discriminant validity of the constructs. Prior to examining the measurement model, we assessed the kurtosis and skewness coefficients for the items under the four constructs: virtual influencer appeal, attitude towards green products, brand engagement, and green purchasing intention.

All the skewness values were less than  $|3|$ , and all the kurtosis values were less than  $|8|$ . This indicates that the data distribution is satisfactory. Our research has verified that the constructions adhere to a normal distribution, which is consistent with findings from earlier studies Podsakoff, MacKenzie, Lee, and Podsakoff (2003). The factor loading study showed 0.691–0.845 (Table 3) is over the recommended threshold of 0.5, as indicated by Joseph F. Hair, Black, Babin, and Anderson (2014).

**Table 2** Means, standard deviations and correlations ( $N=440$ )

Variable	VIAT	ATGP	BEGM	GPIT	Mean	SD
VIAT	-				3.395	1.174
ATGP	0.485**	-			2.948	1.122
BEGM	0.452**	0.780**	-		3.519	0.934
GPIT	0.781**	0.693**	0.758**	-	3.953	0.989

**Notes:** \*\*, correlation is significant at the 0.01 level (1-tailed); \*, correlation is significant at the 0.5 (1-tailed)

VIAT: (Virtual Influencer Attractiveness), ATGP: (Attitude toward Green Product), BEGM: (Brand Engagement), GPIT: (Green Purchase Intention)

Furthermore, the measurement model provided a significant level of fit indices:  $\chi^2(128) = 148.822$ ;  $\chi^2/df = 1.161$ ; GFI = 0.971 > 0.9; AGFI = 0.942 > 0.8; CFI = 0.998 > 0.9; TLI = 0.996 > 0.9; NFI = 0.983 > 0.9 and RMSEA = 0.019 < 0.08 (Fornell & Larcker, 1981), Cronbach's alpha (0.877-0.942) there are good model fit.

**Convergent validity, discriminant validity and common method bias (CMB)**

Table 3 shows no validity issue, as AVE (0.572–0.663) and CR (0.870–0.932) for the constructs were significantly higher than the cut-off values of 0.5 and 0.7, respectively, as recommended by Fornell and Larcker (1981), indicating scale validity.

In order to evaluate the presence of common technique bias in the dataset, we utilized Harman’s single-factor test. The results showed that one factor explained 45.606% of the overall variation, which is below 50% in accordance with the recommendation of Podsakoff et al. (2003).

**Hypotheses results**

We utilized the PROCESS macro 4.2 with model number 6 (Hayes, 2018) to analyze hypotheses testing. Specifically, we tested the direct hypotheses (H1-H6), mediation hypotheses (H7-H8), and serial mediation hypothesis (H9). The bootstrapping process, which involved 5,000 samples, resulted in the calculation of 95% bias-corrected confidence intervals. The results presented in Table 4 and Figure 2 demonstrate the following relationships:

**Table 3** Results of reliability and validity (N=440)

Measurement and Items	Factor Loading	Composite Reliability (CR)	Average Variance Etraction (AVE)	Cronbach Alpha
<b>Virtual influencer attractiveness (VIAT)</b>		0.872	0.578	0.898
VIA1	0.691			
VIA2	0.791			
VIA3	0.764			
VIA4	0.798			
VIA5	0.753			
<b>Green attitude (ATGP)</b>		0.873	0.580	0.901
ATG1	0.815			

**Table 3** Results of reliability and validity (N=440) (Continued)

Measurement and Items	Factor Loading	Composite Reliability (CR)	Average Variance Etraction (AVE)	Cronbach Alpha
<b>Green attitude (ATGP) (Continued)</b>				
ATG2	0.784			
ATG3	0.786			
ATG4	0.723			
ATG5	0.692			
<b>Brand engagement (BEGM)</b>		0.870	0.572	0.877
BEG1	0.704			
BEG2	0.747			
BEG3	0.796			
BEG4	0.771			
BEG5	0.761			
<b>Green Purchase Intention (GPIT)</b>		0.932	0.663	0.942
GPI1	0.791			
GPI2	0.775			
GPI3	0.821			
GPI4	0.815			
GPI5	0.809			
GPI6	0.845			
GPI7	0.840			

Hypothesis 1: VIAT has a significant positive effect on ATGP (effect = 0.745,  $p < 0.001$ ). The results for the M1 variable (ATGP) indicate that this model explains approximately 60.86% of the variance in ATGP ( $R^2=0.6086$ ), with a statistical significance level, hence supporting H1,

Hypothesis 2: VIAT has a significant positive effect on BEGM (effect = 0.207,  $p < 0.001$ ),

Hypothesis 3: VIAT does not have a significant effect on GPIT (effect = 0.063,  $p > 0.05$ ).

Consequently, we rejected H3,

Hypothesis 4: ATGP has a significant positive effect on BEGM (effect = 0.463,  $p < 0.001$ ),

The results for the M2 variable (BEGM) indicate that this model explains approximately 60.12% of the variance in BEGM ( $R^2=0.6012$ ), with a statistical significance level, hence supporting H2 and H4,

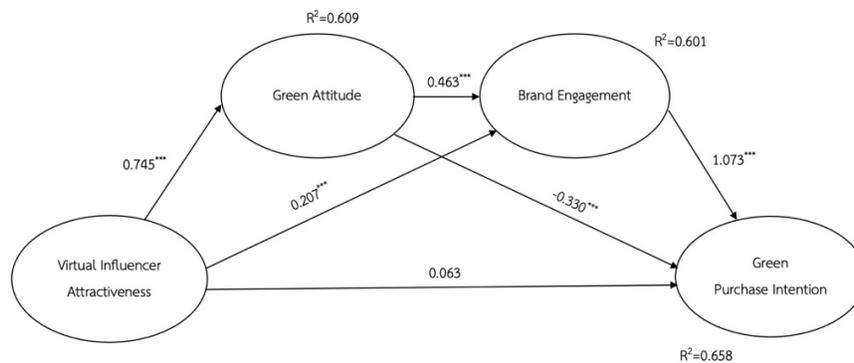
**Table 4** Hypotheses Results (N=440)

Hypotheses	Research questions	Path	Coefficient	t-test	Supported
H1	RQ1	VIAT→ATGP	0.745**	26.097	Yes
H2	RQ1	VIAT →BEGM	0.207**	5.377	Yes
H3	RQ1	VIAT →GPIT	0.063	1.621	No
H4	RQ1	ATGP → BEGM	0.463**	11.508	Yes
H5	RQ1	ATGP → GPIT	-0.330**	-7.327	Yes
H6	RQ1	BEGM →GPIT	1.073**	22.821	Yes

**Notes:** \*\*  $p < 0.001$  or  $t \geq 2.58$ ; \*  $p < 0.05$

Hypothesis 5: ATGP has a significant negative effect on GPIT (effect = -0.330,  $p < 0.001$ ),  
 Hypothesis 6: BEGM has a significant positive effect on GPIT (effect = 1.073,  $p < 0.001$ ).

The results for the Y variable (GPIT) indicate that this model explains approximately 65.76% of the variance in GPIT ( $R^2=0.6576$ ), with a statistical significance level, hence supporting H5, and H6.



**Figure 2** Hypotheses Results

The findings presented in Table 5 indicate that ATGP played a partial mediating role in the association between VIAT and GPIT, thus verifying hypothesis 7 (effect = -0.246,  $p < 0.001$ , VAF=0.603). According to BEGM partially mediated the relationship between VIAT and GPIT, confirming hypothesis 8 (effect = 0.222,  $p < 0.001$ , VAF=0.543).

**Table 5** Results of mediation analysis (N=440)

	Mediation paths	Indirect effects	LLCI	ULCI	p-value	Mediation
H7 RQ2	VIAT→ATGP→GPIT (VAF = 0.603)	-0.246	-0.314	-0.181	<0.001	Partial
H8 RQ2	VIAT →BEGM→GPIT (VAF = 0.543)	0.222	0.140	0.306	<0.001	Partial
H9 RQ2	VIAT → ATGP → BEGM → GPIT (VAF = 0.906)	0.370	0.2891	0.4598	<0.001	Full Sequential

**Notes:** VAF>0.8 (full mediation), VAF=0.2-0.8 (partial mediation), and VAF<0.2 (no significant mediation)

Furthermore, hypothesis 9 is validated, demonstrating a substantial fully mediated impact of ATGP and BEGM on the association between VIAT and GPIT (effect = 0.370,  $p < 0.001$ , VAF = 0.906). The study employed the variance-accounted factor (VAF) to illustrate complete mediation resulting from a total indirect effect of 84.52%, as described by Joseph F. Hair et al. (2014).

### Conclusion and Discussion

Using the outcomes of statistical tests, we may provide an explanation for research question 1: How do VIAT, ATGP, BEGM, and GPIT influence one another among consumers in Thailand? The data is presented in the following manner:

VIAT has a statistically significant impact on both ATGP (Bi & Zhang, 2023; Pick, 2021) and BEGM (AlFarraj et al., 2021; Zheng & Xu, 2024); hypotheses 1 and 2 were supported. Nevertheless, VIAT has not yet directly influenced GPIT, rejecting hypothesis 3. This non-significant finding could be attributed to several factors. Firstly, the attractiveness of virtual influencers, while important, might not be sufficient on its own to trigger a green purchase intention among consumers. Previous research suggests that environmental attitudes and motivations play a more significant role in shaping purchase behavior (AlFarraj et al., 2021; Koay et al., 2022). Additionally, the participants in this study may have been influenced by other external factors, such as financial constraints, which limit their willingness to invest in sustainable products despite a positive perception of virtual influencers. Another possible explanation is that the impact of influencer attractiveness on purchase intentions may vary depending on the type of product being

marketed, with green products potentially requiring a stronger focus on environmental values than what attractiveness alone can provide. Therefore, further research should explore the role of other potential mediators, such as trustworthiness and expertise, which may be more closely tied to green purchase behavior.

This phenomenon can be explained by the fact that attractiveness alone lacks the potency to induce an environmentally friendly purchase intention (AlFarraj et al., 2021; Koay et al., 2022). The statistical analysis reveals that ATGP and BEGM play a critical role in this study's model. In accordance with the concepts of the source of credibility model, it may be necessary to incorporate additional motivational factors such as trustworthiness, expertise, and attractiveness (Ohanian, 2013).

The study found that ATGP has a significant impact on both BEGM (H4) (Park, 2022) and GPIT (H5) (Bi & Zhang, 2023; Duong, 2022; Kumar, 2024; Rūtelionė & Bhutto, 2024), suggesting that individuals with a positive attitude towards green products are more inclined to develop brand engagement. This leads to a stronger intention to purchase environmentally friendly products, supporting hypothesis 6. Hypothesis 6 proposes that a higher level of consumer engagement with a brand will have a greater influence on their intention to purchase green products (Amankona et al., 2024; Duffett & Maraule, 2024; Hanaysha, 2022; Zheng & Xu, 2024). Despite a statistically significant association between ATGP and GPIT, the negative coefficient of standard regression indicates that a rise in one ATGP variable will lead to a drop in the value of the GPIT variable. This study necessitates a further examination and investigation of the phenomenon.

Hypothesis 5 demonstrates that Attitude toward Green Products (ATGP) has a significant negative effect on Green Purchase Intention (GPIT), indicating an inverse relationship between these two variables. This phenomenon may be attributed to the higher prices of sustainable fashion products compared to conventional items. The majority of our sample consists of individuals earning less than 10,000 baht per month, suggesting that a positive attitude toward green products alone may be insufficient to foster green purchase intention.

In the context of research question 2, How do ATGP and BEGM mediate the interaction between VIAT and GPIT? The following is an explanation of the results of the statistical tests.

ATGP plays a role as partial mediation in the relationship between VIAT and GPIT (H7) (Bi & Zhang, 2023; Kumar, 2024; Rūtelionė & Bhutto, 2024), which means that VIAT can influence GPIT

partially through changes in ATGP. However, there are still some influences that do not pass through ATGP. Similarly, BEGM serves as a partial mediator in the association between VIAT and GPIT (H8) (Amankona et al., 2024; Ismail et al., 2024). This implies that VIAT has the ability to transfer its effect to GPIT by means of alterations in BEGM to some extent, while also exerting certain impact that is not dependent on BEGM.

Furthermore, ATGP and BEGM function as full sequential mediators in the relationship between VIAT and GPIT (H9). This implies that VIAT has the ability to transfer its impact to the GPIT by modifying two specific variables, namely ATGP and BEGM. These two variables play a crucial role in the connection between VIAT and GPIT. According to the research conducted by Zheng and Xu (2024) and Ismail et al. (2024), despite the slightly different sequencing of the variables in their studies, it is clear that the variables in Hypothesis 9 hold significant importance and can be sequentially linked to promote environmentally friendly purchasing intentions. Therefore, the study supported eight hypotheses and rejected one.

The findings indicate that the attractiveness of virtual influencers alone does not have a significant impact on green purchase intentions. In this study, the model emphasizes the importance of considering attitudes towards green products and brand engagement as full serial mediators. However, the impact of attitude towards green products and brand engagement on the relationship between virtual influencer attractiveness and green purchase intention is partial. This demonstrates the significance of the model in studies that examine serial mediation.

### **Limitation, implications and direction for future studies**

The primary limitation of this study lies in the use of data collected from a specific group of individuals in Thailand, within the context of sustainable fashion. Sampling from only one province in each of the six regions may not provide sufficient evidence for generalizing the results to the broader population. This limitation, along with potential sampling bias due to the limited geographic and demographic diversity of the sample, could contribute to a more complex process of interpreting how virtual influencer attractiveness influences green purchase intentions. It may also explain why virtual influencer attractiveness does not have a direct and statistically significant effect on green purchase intentions.

Despite this, the findings align with the Stimulus-Organism-Response Theory, where the attractiveness of virtual influencers functions as the stimulus, while attitudes towards green

products act as the organism. The response is reflected in the levels of consumer engagement with brands and their intentions to make green purchases. These results have practical implications for businesses, suggesting that employing virtual influencers in advertising campaigns can effectively promote environmentally responsible purchase intentions. Firms focused on sustainability can enhance their competitive advantage by prioritizing marketing elements that drive green purchase behavior.

Furthermore, future research should explore a broader range of factors beyond mere attractiveness when examining virtual influencers in advertising. Investigating the model of source credibility—particularly trustworthiness and expertise—could offer valuable insights for refining marketing strategies. Additionally, expanding research to include other industries such as beauty, health, food, technology, and tourism would enhance our understanding of virtual influencers' effectiveness across diverse consumer sectors. The impact of virtual influencers in the technology sector, particularly in promoting sustainable technologies and addressing environmental concerns, should also be explored. Comparing virtual influencers with traditional influencers in various product categories could reveal their unique advantages and limitations in advertising.

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## Exploring Factors Influencing Product Innovation Excellence: Performance Indicators in Small Business Enterprises

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### Abstract

The objective of this study is to examine the factors contributing to product innovation excellence and the performance indicators in small businesses. The sample consists of 30 small businesses enterprises in Kalasin Province, Thailand, registered with the Department of Agricultural Extension. This research employs a qualitative methodology, utilizing interviews with leaders of small businesses. The findings indicate that the factors of product innovation excellence include imaginative development, improvement existing, team happiness, and innovative management. Additionally, the product performance indicators identified are profit evolution and production excellence. The results suggest that the factors contributing to product innovation excellence can enhance the competitiveness of small businesses by enabling the development of products that meet customer needs and by promoting continuous improvements in the production process. Furthermore, performance indicators not only aid in evaluating the success of the business but also foster sustainable improvements and developments across various aspects of small businesses enterprises.

**Keywords:** Product innovation excellence, Performance indicators, Profit evolution, Production excellence, Team happiness

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## Introduction

Currently, small business serves as a vital component of the grassroots economy, generating returns for local communities and society at large. Fostering an environment conducive to entrepreneurship and innovation is crucial (Somwethee et al., 2023). In the fast-evolving economic landscape, small business enterprises must effectively communicate changes in their products, whether it is a shift in format, an overall rebranding, or innovations in product development. Such communication is vital for achieving success and meeting organizational goals (Hatak et al., 2016). Therefore, organizations must understand how to develop strategies that facilitate product purchases (Cavite et al., 2021). Today, many small businesses struggle with managing the production of products that do not meet market demand and lack adequate market support. Additionally, their sales diversification is hindered by a failure to target specific customer segments, and they often lack modern management planning, particularly in terms of customer engagement and new product innovation. Therefore, small business must evolve their products and be prepared to compete to achieve their goals. According to a study by Hyytinen et al. (2015), small businesses enterprises should prioritize building product management processes to ensure continuity and produce quality products. This includes expanding sales promotion and public relations channels and utilizing modern management strategies (Ng et al., 2019). Research by Marion et al. (2012), and Sethir et al. (2012), suggests that the management of prototype products should be designed to promote consistency. Effective management of resources and raw materials is crucial in the initial validation process before launching a new product to the market.

Previous studies have highlighted the lack of interest in studying product-related innovation management that affects operations, especially in the context of small businesses. Therefore, researchers must collect empirical data to have a clear understanding of this topic (Rajapathirana & Hui, 2018). Research focusing on small businesses enterprises in Thailand is an important area of study, as these businesses significantly contribute to income generation through small business enterprises development. Information derived from these studies plays a crucial role in driving the local economy, serving as the foundation for business development and expansion. Therefore, this research aims to examine insights into Product Innovation Excellence in small businesses enterprises

and its profound impact on performance and future direction. To achieve this goal, the following research questions are posed:

RQ1. What factors affect the adoption of product innovation excellence in small business enterprises?

RQ2. What performance indicators influence small business enterprises?

The objective was to explore factors influencing product innovation excellence and performance indicators in small businesses. By understanding these factors, small business enterprises can effectively apply product Innovation Excellence and utilize performance indicators to achieve better outcomes.

### **Literature review**

Managing innovation to improve and optimize products in small business enterprises is based on the theory of dynamic capabilities. This theory emphasizes an organization's ability to adapt and gain a competitive advantage in a rapidly changing environment (Teece et al., 1997). It consists of integrating, building, and configuring internal and external capabilities. Different organizations may take various approaches to implementing dynamic capabilities consistent with external changes. This involves acquiring new resources and defining new methods (Eisenhardt & Martin, 2000; Zahra et al., 2006). Capability theory is an approach used to bridge the gap between organizational capabilities and environmental change (Albort-Morant et al., 2018). An organization's ability to continuously adapt to internal resources and environmental changes determines its competitiveness and performance (Helfat & Peteraf, 2009). Research has demonstrated differences in these components across various contexts (Hermawati, 2020). This study focuses on exploring the product innovation excellence used by small business enterprises to improve and optimize products, considering the relationship between dynamic capabilities theory and the success and growth of organizations.

### **Product innovation excellence**

Product innovation management is a critical factor that provides direction for developing, maintaining, and improving systematic practices in managing innovation. These practices are derived from a review of the literature on fundamental theoretical concepts related to innovation within an organization. Understanding the product profile and effectively managing it is crucial (Rusch et al., 2022). It is suitable for organizations that can survive and create value from their existing resources.

Competitive advantages can be attained even in an era of rapid social change. Additionally, there are ideas concerning innovation at the organizational level and innovation management at the organizational level. Rogers (2002), and Peres, Muller, and Mahajan (2010), identified the evolution of modern product models, communication, distribution management, and innovation in new products and services as channels that strengthen the driving force toward positive social development. Focusing on creating products that meet customer needs and modern management practices (Ato Sarsah et al., 2020; Scott & Bruce, 1994). Furthermore, they also identify the ability to thoroughly conduct research as an important aspect of innovation management.

Innovation is defined through a continuous review of its relation to the development of economically and socially significant products. Current research emphasizes linking products and creating strategies to achieve goals (Wang & Su, 2022). Attracting talent is an important aspect to consider, as the ability of personnel directly affects the success of product development. Preparing and developing the skills of the team will help increase efficiency in responding to market demands (Schulte & Knuts, 2022). In general, Product development is an important element to consider, as it leads to increased returns for the organization (Vermeulen, 2005). Bhaskaran et al. (2006), state that product innovation management consists of creating new products, developing new production processes, entering new markets, utilizing new sources of raw materials, and establishing new organizational structures. Chang and Lee (2008), outline the components of product innovation management, which include new product development, creating new production processes, establishing new organizations, implementing new management techniques, and improving existing products.

### **Performance organization**

The performance indicators of an organization are derived from the collaboration of all its members, as indicated by a review of literature and theories. It has been demonstrated that concepts related to performance aim to enhance outcomes in various contexts and under different conditions, according to administrative theory (Ven et al., 1984). Additionally, new ideas about organizational management, such as learning organizations, have been proposed (Burgoyne, 1995). Nevertheless, previous research by Ato Sarsah et al. (2020), has mentioned that leaders' potential must include a thoughtful approach to managing overall images and product production. Tian et al. (2020), also noted that learning management positively impacts organizational innovation and

efficiency. Therefore, operators must carefully consider the implications of theories and ideas about performance.

Kaplan and Norton (2000), define performance as the overall picture of an organization's operational processes, management activities, various goals for resource allocation, and the ability to enhance production capabilities. Furthermore, Schulte and Knuts (2022) and Garvin (1998), define performance as the ability of a business to disseminating knowledge and skills while improving the fundamentals of the business to aim for new knowledge creation for product and process development. The components of measuring performance include the financial perspective, customer perspective, internal business processes, and learning and growth (Robert S. & Norton, 2000). Chatchai and Ussahawanitchakit (2016) other studies aimed to measure objectives in monetary terms and the evaluation process suggests that larger organizations provide more accurate and detailed information to address broad objectives than smaller organizations, which tend to offer less financing (Charles & Dzvuke, 2015).

## Research methodology

### Sample and data collection

The sample of interviewees consisted of representatives from 30 small enterprise groups, 1 person per group, 30 small business leaders, small enterprise leaders in Kalasin Province, Thailand, and had been registered and certified by the Provincial Department of Agricultural Extension. These small enterprises were divided into production and service groups (Group, 2022), Referring to the research of Hagaman and Wutich (2017), to obtain saturated data which was between 20 and 40 interviews to obtain saturated data for the content covered by purposive sampling. The characteristics of the selected groups were in accordance with the research objectives (Division, 2022). The researchers selected groups that had achieved a strength level of 3-5 over the past three years and contacted them for interviews via telephone. The small business enterprises leaders agreed to participate in the study and provide additional information (Tuan et al., 2016). Basic demographic information about the 30 participating leaders indicated that 66.67% were female and 33.33% were male, with ages ranging from 40 to 66 years. The majority had completed primary school (66.67%), followed by high school (6.67%), vocational certificates (13.33%), and bachelor's degrees (13.33%). The participants had between 3 and 24 years of experience in small enterprise operations.

## Measurement

Product innovation excellence, in the context of studying the operations of small business enterprises, may provide valuable insights into the relationship between product innovation management and business performance through empirical research (Blumenthal & Jensen, 2019). Collecting data through in-depth interviews allows researchers to obtain accurate information based on the thoughts of interviewees (Pervez et al., 2020). Semi-structured interviews were utilized to explore various aspects of product innovation management excellence, including performance indicators that served as data for analysis. The data were collected through these semi-structured interviews, which included open-ended questions designed based on previous research, as illustrated in to adapt questions from the Interview Question Framework Structure regarding product innovation excellence and performance indicator issues, the following questions are formulated based on the works of these questions aim to assess the innovation practices and performance metrics within organizations. Gunday et al. (2011), Makanyeza et al. (2023), Apanasovich et al. (2016), Zahay et al. (2018). Leaders of small businesses enterprises were interviewed because they could provide comprehensive information on product innovation management and performance indicators. The interviews were conducted during field visits to small businesses enterprises, with each interview lasting approximately 20–30 minutes. All interviews were recorded with the consent of the interviewees. The analysis employed learning techniques, incorporating both content analysis and thematic analysis.

## Results and Discussion

Research in small business enterprises has identified several factors that affect product innovation excellence. These include the development of differentiated products or services aimed at new markets, which is a crucial aspect of innovation. Research and development are important strategies that enable businesses to improve and create new products efficiently. Professional management and strategic planning are essential for the successful introduction of innovations to the market, including considerations of product identity and appropriate packaging, both of which are vital for enhancing the value and appeal of products. To achieve this, organizations must foster effective teams and encourage collaborative efforts that benefit the business. Developing efficient work processes by minimizing unnecessary steps and introducing

new technology can significantly reduce costs and increase productivity. It can be concluded that these factors are critical in promoting product Innovation Excellence in small businesses, as illustrated in Table 1.

This summary highlights the factors affecting product innovation excellence. The first factor is imaginative development (ID), which involves creating products or services that are unique and innovative. This approach helps businesses stand out in the market by addressing customer needs in unprecedented ways, such as developing new technologies that add value to products. The second factor is improvement existing (IE), which focuses on enhancing and updating current products to increase their market value and popularity. This includes adding new features or improving performance to better meet customer needs. Third, team happiness (TH) emphasizes the importance of a collaborative work environment, where team members support and guide one another to develop their potential for mutual benefit.

Finally, innovative management (IM) refers to the creation of management equipped with the knowledge and skills to bring innovations to market. This involves having a group with expertise and a commitment to developing cutting-edge products or services that respond to market demands. Effective planning and management should prioritize integrating innovation within the organization, fostering an environment that supports creativity. This includes creating incentives and establishing a system that promotes innovation in a way that is beneficial for employees. These factors can be summarized as shown in Figure 1.

**Table 1** Factors Affecting Product Innovation Excellence

Factors	Subtheme	Exemplary comments	N=30
			Number of respondents
Imaginative Development (ID)	- Different products development	Make a difference, innovate, make new things beyond what has already been done	15
	- Ideas and designing research	Seeking knowledge, renewing, reworking, rebuilding	13

**Table 1** Factors Affecting Product Innovation Excellence (Continued)

			N=30
Factors	Subtheme	Exemplary comments	Number of respondents
Imaginative Development (ID) (Continued)	- Product development guidelines	panning, a market analysis, professional consulting, a network, readiness, and manpower	12
	- Improve existing products	Market demands, more alternatives	14
	- Value enhancement of existing products	uniqueness, value, popularity, sufficient resources	10
Improvement Existing (IE)	- Modifications in appearance packaging	Suitable, convenient, consistent, beautiful, clean, and safe	6
	- Teamwork	Motivate, encourage, promote, assist, advise, work together for joint benefit	14
	- joint benefit		
Team Happiness (TH)	- Motivate		
	- Developing new innovative processes	Increasing-reducing steps, using new tools and new technologies	13
Innovative Management (IM)	- Work allocation	consulting, assisting, seeking opportunities, solving problems,	10
	- Process management and presentation	Process, supervision, control, drive, and service	15

\* Frequency data for 20 percent of those interviewed.

Research on small businesses enterprise has identified several key performance indicators that are crucial for success. Effective product delivery planning and control reduce product returns and enhance customer satisfaction. Maintaining product quality standards through thorough inspections enables businesses to generate reasonable profits. Additionally, continuous product improvement and value addition lead to increased sales and orders. The utilization of local resources, along with human labor, helps reduce costs and increases production efficiency. Efficient operations result in the production of quality products that meet specified standards. All these factors contribute to the performance indicators of small businesses, as summarized in Table 2.

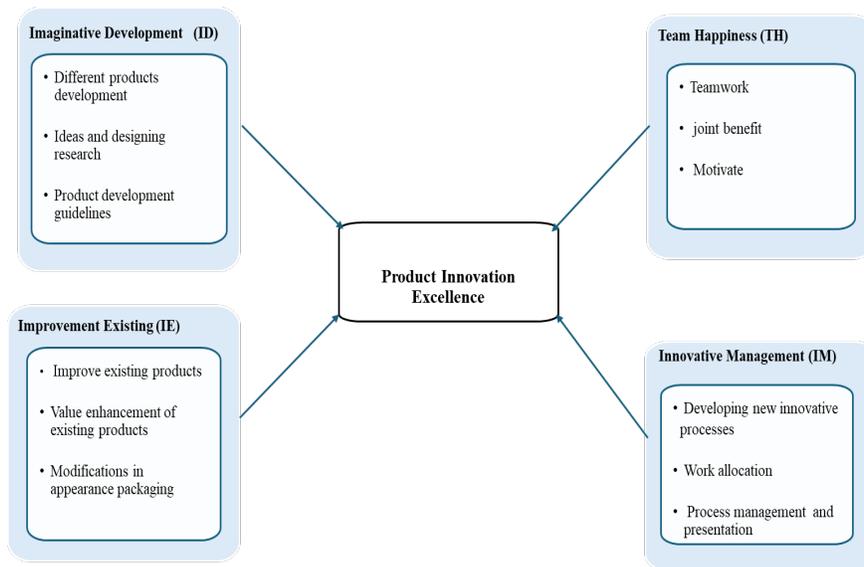


Figure 1 Factors Product Innovation Excellence.

Table 2 Small Business Enterprise Performance Indicators

			N=30
Factors	Subtheme	Exemplary comments	Number of respondents
Profit Evolution (PEv)	- Sales returns.	Better return rate, reasonable profit generated proportion.	15
	- Positive change in net profit from new product creation.	More sales, more orders	6

**Table 2** Small Business Enterprise Performance Indicators (Continued)

			N=30
Factors	Subtheme	Exemplary comments	Number of respondents
	-Positive change in net profit from improving existing products.	Orders, reservations, sales.	14
Production Excellence (PEX)	-Decline on product rejection rates.	Maintain quality with standards, check list.	15
	-Improve product delivery on time.	Delivery planning and control.	15
	-Improve the tools, materials, and equipment.	Inspection, repair, safety.	9
	-Reduce production loss.	Revise, reformulate, and add value.	7
	-Reduce production cost.	Local resources with manual labor.	15

\* Frequency data for 20 percent of those interviewed.

This summary highlights the factors affecting performance indicators. First, profit evolution demonstrates that the business has experienced a better return rate on sales, leading to a reasonable profit margin. Additionally, the positive change in net profit resulting from the creation of new products has led to increased sales and a higher volume of orders. Similarly, the improvement of existing products has also contributed to higher orders, reservations, and overall sales, further enhancing our financial performance. Finally, production excellence ensures a decline in product rejection rates through our commitment to maintaining quality standards via a comprehensive checklist. Furthermore, we are enhancing our product delivery times by implementing effective delivery planning and control measures. Our focus on improving tools, materials, and equipment includes conducting regular inspections, repairs, and safety checks. Additionally, we are working to reduce production loss by revising processes, reformulating

products, and adding value wherever possible. By utilizing local resources and manual labor, we aim to significantly reduce production costs while maintaining efficiency. This can be summarized as shown in Figure 2.

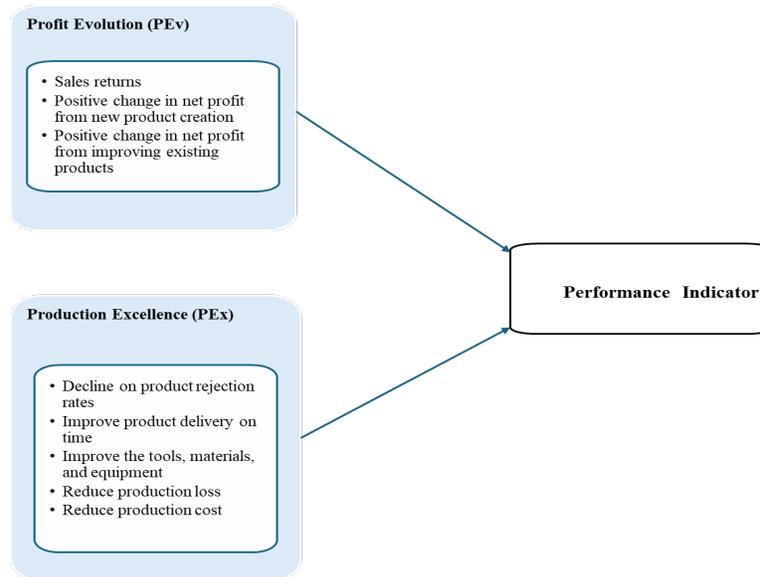


Figure 2 Small Business Enterprise Performance Indicators.

## Discussion

The research found that the results of this research emphasized product innovation excellence. However, the ability to adapt to market and customer needs can be gained in products. Increasing product quality and differentiation, increasing customer confidence are very important in Thailand, which is a developing country in terms of both local development and the use of local resources to be outstanding. And importantly, it must be excellent at the same time to be able to generate sustainable income for the country. This research underscores the importance of product innovation excellence for small enterprises, particularly in Thailand. It highlights the need for adaptability to market and customer demands through enhanced product quality and differentiation. Utilizing local resources effectively can create competitive advantages and drive sustainable income while promoting process standardization to increase overall organizational value (Cavite et al., 2021). Key factors influencing product innovation include imaginative development, which fosters unique products and addresses consumer needs, and continuous research that aligns offerings with market trends (Makanyeza et al., 2023). Improving

existing products through effective design and packaging can further enhance customer appeal (Yasir et al., 2021). Teamwork happiness is essential in small businesses, as it promotes a collaborative environment conducive to innovation and agile problem-solving (Calderon et al., 2021). Innovation management plays a crucial role in improving operational efficiency by streamlining processes and adopting new technologies, which are vital for competing in today's market (Hanifah et al., 2019). Moreover, organizational culture significantly impacts product innovation and creates an environment that supports development (Zahay et al., 2018). Furthermore, organizational culture and innovation significantly impact transportation efficiency, along with entrepreneurship, number of employees, and investment levels (Wongpun & Inmor, 2023).

The research also emphasizes the importance of government and educational institution support for small enterprises, helping them thrive as key contributors to the economy (Abhari et al., 2021). Performance indicators, particularly profit evolution, net profit, sales growth, and liquidity, are essential for assessing business health and long-term sustainability (Charles & Dzvuke, 2015). By focusing on production excellence and minimizing rejection rates, small businesses can enhance quality and build customer loyalty, Ding and Ding (2022), ultimately driving growth and community development (Deku et al., 2021; Ng et al., 2019). Leveraging local resources further reduces costs and strengthens community ties, fostering sustainable economic growth (Charles & Dzvuke, 2015).

## Conclusion

This study identifies key factors driving product innovation excellence in small enterprises. By prioritizing creative development and continuous research, businesses can effectively address consumer needs in Thailand's unique market. Enhancing existing products helps maintain market relevance, while fostering teamwork supports operational success in developing countries. Effective innovation management optimizes processes and leverages new technologies, empowering small enterprises to achieve sustainable growth and adapt to market demands. Key performance indicators (KPIs), especially profit evolution, are crucial for assessing small business health and growth potential. Metrics such as net profit, sales growth, and order growth evaluate business strength, while liquidity is vital for long-term sustainability and innovation investment. Emphasizing

quality, timely delivery, and community engagement strengthens the competitive edge of Thai small businesses. Production excellence is particularly important in Thailand, where budget constraints demand strict adherence to quality standards. Strategies to reduce product rejection rates and improve resource utilization foster customer trust and loyalty. Leveraging local resources not only lowers costs but also enhances operational efficiency and community ties, promoting sustainable economic growth.

Future research should explore factors driving product innovation excellence and sustainable growth in Thai small businesses. Key areas include adapting development to emerging consumer trends, the impact of teamwork on productivity, and assessing innovation management approaches. Expanding KPIs beyond profitability and examining the economic benefits of local resources will improve liquidity assessments. Long-term studies are needed to evaluate the impact of these strategies. Prioritizing these factors will provide practical strategies for small enterprises navigating dynamic markets. This study acknowledges limitations, including the focus on internal organizational factors and the need to consider external influences such as government support and access to resources. Promoting an innovative culture remains essential for fostering creativity and sustainable growth. Future research should examine KPIs in the context of development in Thailand, including exploring their impact on innovation management and operational performance.

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# Responsiveness and Attitudinal Change of Agricultural Cooperative Firm's Officers (ACOs) to Technological Disruption of Jasmine Rice Business of Thailand

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## Abstract

This study investigates the responsive strategies and attitudinal changes of Agricultural Cooperative Firm's Officers (ACOs) to technological disruption in the Jasmine Rice business in Northeastern Thailand. The research aims to understand how ACOs perceive and respond to technological advancements and how their attitudes towards organizational intangible capital affect the business performance. The study employs a mixed-methods approach, combining quantitative analysis of survey data from 180 ACOs with qualitative insights from focus group discussions. The result shows that the ACOs have a positive attitude toward technological change, yet experience constraints in accessing and utilizing data. Regarding other intangible capitals (human, information, organization and management), they have positive viewpoints varying by their job positions. However, information capital is a mere factor affecting Asset Turnover Ratio (ATO) at a statistically significant level. The findings underscore the importance of information literacy and data-driven decision-making. To aid cooperatives, the 5D model (Dream, Discover, Define, Design, Develop) is presented as a framework for developing strategic business plans,

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enabling systematic resource assessment, challenge identification, and targeted interventions. This could conclude that information capital is a significant factor affecting the performance of agricultural cooperatives in the technologically disruptive era.

**Keywords:** Information Capital, Asset Turnover, Agricultural Cooperatives, Technological Disruption

## Introduction

Thailand is one of the world largest exporters of Jasmine rice, of which presents highest value among rice production of Thailand. Therefore, agricultural cooperatives are a crucial mechanism that enables farmers to trade rice both domestically and internationally.

Technological advancements and disruptions are reshaping business, altering consumer behavior and operational models. Agricultural cooperatives face significant pressures from these changes, particularly concerning managerial capacity for digital technology integration, as evidenced by declining rice cooperative numbers in Thailand. Understanding cooperative adaptation is thus crucial for their sustainability and rural impact. This research identifies pathways to enhance cooperative resilience and performance in this evolving digital landscape.

This study explores cooperative adaptive behaviors by assessing responsiveness to digital disruption through two key dimensions: (1) proactive responsive strategies (marketing, market intelligence, logistics) as direct adaptation measures; and (2) staff attitudes towards intangible capital (human, information, organizational, management), recognized in literature as key enablers for leveraging technological change. Analyzing these dimensions' effects on cooperative performance will inform technology adoption recommendations for the sustainability of Thai agricultural cooperatives.

## Objectives of the study

1. To understand the current status of agricultural cooperatives concerning ACOs' perceptions of responsive strategies (marketing strategies, market intelligence, logistics & distribution) and their attitudes toward organizational intangible capital (human capital, information capital, organizational capital, and management).
2. To investigate the extent to which ACOs' perceptions of responsive strategies (including marketing strategies, market intelligence, and logistics & distribution) and their attitudes

toward organizational intangible capital (human capital, information capital, organizational capital, and management) affect cooperative business performance (measured by ATO, ROA, and NPM).

3. To develop appropriate policy recommendations in response to findings which might contribute to ACO development.

## Literature Review

Businesses employ responsive strategies to navigate digital disruption (Osano, 2019), adapting to market shifts and customer demands. Effective response transcends mere technology application, requiring an understanding of consumer behavior and operational adaptation (Donthu & Gustafsson, 2020).

For agricultural cooperatives, this study conceptualizes responsive strategies via three critical dimensions: Marketing Strategies (adapting to consumer preferences and new channels), Market Intelligence (data-driven decision-making), and Logistics & Distribution (optimizing operations and market access).

The study also examines staff attitudinal changes towards technological shifts, as attitudes influence technology adoption (Mueller et al., 2017). Intangible capital encompassing human, information, and organizational capital is critical for organizational performance and competitiveness (Kaplan & Norton, 2004; Chareonsuk & Chansa-ngavej, 2008; Saddam & Jaafar, 2021). Effective management in leveraging these assets is also emphasized (e.g., Kinicki & Williams, 2016; Das & Mishra, 2019).

Based on this literature, a research framework is developed to investigate how responsive strategies and attitudes towards intangible capital affect cooperative performance, leading to testable hypotheses.

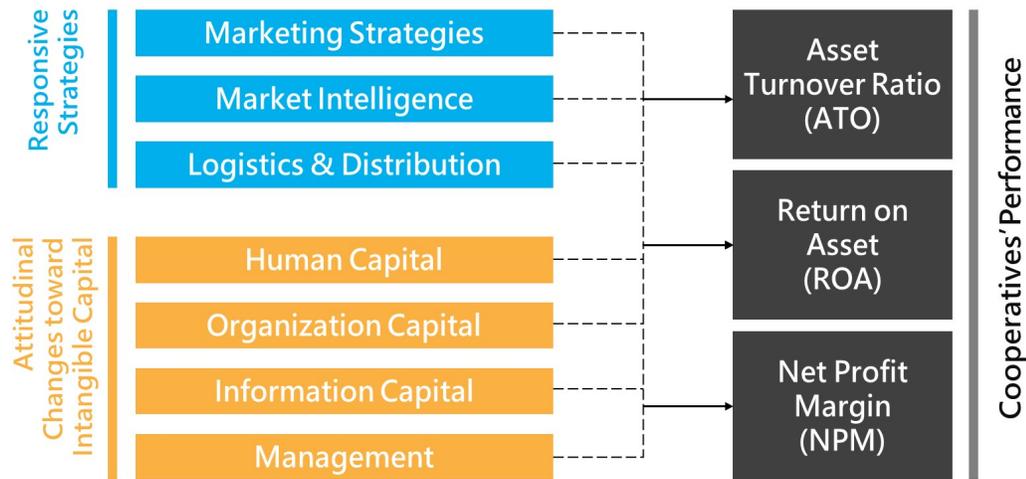


Figure 1 Research Framework

## Research Hypotheses

H1: ACOs demonstrate measurable levels of perception regarding responsive strategies (Marketing strategies, Market Intelligence, and Logistics & Distribution).

H2: ACOs demonstrate measurable levels of attitude toward key organization's intangible capitals (Human Capital, Information Capital, Organizational Capital, and Management).

H3: ACOs' perceptions of responsive strategies (Marketing strategies, Market Intelligence, and Logistics & Distribution) have a significant effect on cooperative business performance.

H4: ACOs' attitudes toward key organization's intangible capitals ( Human Capital, Information Capital, Organizational Capital, and Management) have a significant effect on cooperative business performance.

## Methodology

This study employed a mixed-methods approach. The quantitative phase surveyed 180 Agricultural Cooperative Firm's Officers (ACOs) using a structured questionnaire. This instrument, assessing perceptions of responsive strategies (marketing, market intelligence, logistics & distribution) and attitudes towards intangible capital (human, information, organizational, management) via a 5-point Likert scale, demonstrated strong content validity (expert panel, Item-Objective Congruence average: 0.91) and reliability (Cronbach's Alpha > 0.80 for all constructs). Data were analyzed using descriptive

statistics and multiple regression to examine effects on cooperative business performance, measured by Asset Turnover (ATO), Return on Assets (ROA), and Net Profit Margin (NPM).

The qualitative phase involved focus group discussions (FGDs) with two purposively selected groups (5 management personnel, 5 committee members) from Northeastern Thailand's Jasmine Rice cooperatives, chosen for their extensive experience and leadership roles. FGDs aimed to explore quantitative findings further. Transcribed data were thematically analyzed to identify key themes and patterns, helping to triangulate results and provide richer context.

## Results

The results of this study are presented in three main sections, structured to systematically address the research objectives. First, descriptive statistics are provided to address the first objective by illustrating the general characteristics of the respondents (ACOs), their perceptions toward responsive strategies (marketing strategies, market intelligence, and logistics & distribution), their attitudes toward organizational intangible capital (human capital, information capital, organizational capital, and management), and the current status of the cooperative's business performance. Next, to address the second objective, the results of the multiple regression analysis are presented, examining the effects of ACOs' perceptions of responsive strategies and their attitudes toward organizational intangible capital on cooperative business performance. Finally, the insights from the focus group discussions are provided to support and contextualize the quantitative findings, offering deeper understanding related to both the current status and the investigated effects.

### Respondent Characteristics

Data were gathered from 180 Agricultural Cooperative Firm's Officers (ACOs). Demographics revealed a balanced gender distribution (52.22% male, 47.78% female). The largest age groups were 41-50 years (30.56%) and 31-40 years (28.33%), representing a notable middle-aged cohort. Educationally, most respondents (78.89%) held bachelor's degrees or vocational certificates.

Work experience varied: 43.89% had 10-20 years of experience in agricultural cooperatives, while 28.33% had less than 10 years. In their current positions, 56.67% had under 10

years of experience, and 33.89% had 10-20 years. In summary, participants were diverse in age and experience, with most holding bachelor's degrees or vocational certificates.

### **Perceptions and Attitudes**

This section presents findings on ACOs' perceptions of responsive strategies and attitudes toward intangible capital.

#### **Perceptions of Responsive Strategies**

ACOs showed moderate agreement on developing market strategies (mean=3.16), with high agreement on improving product quality (mean=3.99) and brand recognition (mean=3.56), but less on enlarging product size (mean= 2.21). Perceptions of market intelligence were low (mean= 2.29), with limited views on managing information for market insights (mean= 2.76) or adjusting data input (mean= 2.31). Perceptions of logistics and distribution were moderate (mean= 2.67), agreeing on adjusting product transportation (mean= 2.77) and distribution (mean=2.60).

#### **Attitudinal Change Toward Intangible Capital**

Attitudes toward human capital were moderate (mean=3.21), agreeing on developing staff skills (mean= 3.14), reskilling (mean= 3.20), and recruiting new staff (mean= 3.28). Attitudes toward information capital were also moderate (mean= 3.06), with agreement on data-driven organizational improvement (mean= 2.61), utilizing customer data (mean= 3.26), and improving infrastructure (mean=3.32). Organizational capital attitudes were moderate (mean=3.26), agreeing on prioritizing organization management (mean=3.18), digital leadership (mean=3.32), and digital-related policies (mean= 3.28), with perceptions varying by staff positions. Attitudes toward management were low (mean=2.71).

#### **Cooperatives' Business Performance**

Cooperative business performance, reflecting effectiveness in achieving objectives beyond financial gains, was assessed using key financial indicators. Asset Turnover Ratio (ATO), indicating asset management efficiency, averaged 0.38 for sampled cooperatives, lower than the 2022 agricultural business average (0.52), suggesting lower efficiency. Return on Assets (ROA), measuring earnings generation from assets, averaged 0.77%, also below the industry average (1.14%), indicating lower asset management efficiency. Net Profit Margin (NPM), the percentage of

revenue remaining as profit, averaged 3.15%, outperforming the industry average (2.20%), indicating higher proficiency.

### Multiple Regression Analysis

Multiple regression analysis examined the relationships between seven independent variables (perceptions of three responsive strategies (marketing, market intelligence, logistics & distribution) and attitudes toward four intangible capital components (human, information, organizational, management) and three dependent performance variables: Asset Turnover (ATO), Return on Assets (ROA), and Net Profit Margin (NPM). Detailed statistical outputs are summarized in Table [X] (Note: Insert table number here).

The model for ATO was statistically significant ( $p = 0.041$ ), explaining 8% of its variance ( $R^2 = 0.080$ ). Information Capital was the sole significant positive predictor of ATO ( $p = 0.002$ ); the other six independent variables (perceptions of marketing strategy, market intelligence, logistics & distribution, and attitudes toward human capital, organizational capital, and management) showed no significant effect.

$$\begin{aligned} \text{ATO} = & 0.183 + 0.026\text{Avg\_MS} - 0.41\text{Avg\_MI} - 0.035\text{Avg\_LD} - 0.026\text{AC.HC} \\ & + 0.122\text{AC.IC} - 0.013\text{AC.OC} + 0.010\text{AC.MN} \end{aligned}$$

Conversely, the regression models for ROA ( $p = 0.394$ ) and NPM ( $p = 0.603$ ) were not statistically significant. This indicates that the combined set of seven predictor variables did not demonstrably affect these broader performance measures in this study.

Consequently, H1 and H2 (regarding measurable levels of perceptions and attitudes) were supported. H3 (responsive strategies affecting performance) was rejected. H4 (intangible capital affecting performance) was partially supported, with only Information Capital significantly impacting ATO.

### Focus Group Discussions

Focus group discussions (FGDs) with two distinct groups, each comprising 10 purposively selected participants (management personnel and committee members from Northeastern Thailand's Jasmine Rice cooperatives) explored their views on technological disruption and factors influencing cooperative performance.

Management personnel highlighted challenges from disruptions, changing consumer preferences, and competition, acknowledging the need to adapt and innovate. They discussed effective marketing (including online platforms), the need for market intelligence (admitting a lack of systems/expertise), efficient logistics (e-commerce potential), human capital development, effective information management, strong organizational structure, and crucial management roles (leadership, strategic vision, innovation culture).

Committee members echoed many points, but with a stronger emphasis on trade networks over marketing strategies and unanimously agreed on the lack of systems and expertise for market intelligence. They also stressed efficient logistics, and the importance of human, information, organizational capital, and management.

Overall, FGDs revealed common challenges and opportunities regarding technological adaptation and intangible capital utilization. Both groups underscored adapting to technological changes and enhancing organizational capitals. Key distinctions included management's focus on broader strategic innovations versus committee members' emphasis on established trade networks and operational efficiencies. However, both converged on the critical need for improved market intelligence and human capital development.

## Discussion

This study's findings indicate that while agricultural cooperatives demonstrate some potential for strategic adaptation to technological disruption, internal constraints hinder their full capabilities. ACOs' moderate perception towards developing marketing strategies, as revealed by survey data, aligns with FGD insights where participants acknowledged needing to move beyond traditional approaches towards online platforms (consistent with Osano, 2019, on SME marketing support needs). However, the low perception of market intelligence (survey mean= 2.29) was strongly collaborated by FGDs, where both management and committee members highlighted a lack of understanding and systems for data utilization to derive market insights. This resonates with challenges identified by Chiochan et al. (2000) regarding IT use in Thai agricultural cooperatives and underscores the critical need for improved data analytics for effective market response (Kotler, 2000; Chen & Siau, 2012). Similarly, moderate perceptions of logistics and distribution were nuanced by FGDs, revealing a reluctance to establish collaborative networks due to perceived competition, contrasting

with cooperative principles (Barton, 2000), despite recognizing the importance of efficiency (Baourakis et al., 2002).

Regarding intangible capital, moderate attitudes towards human, information, and organizational capital, and low attitudes towards management, were observed. These quantitative findings were enriched by FGDs, which revealed varying priorities across positions and challenges in skill development, data utilization, and consistent management approaches. This aligns with literature emphasizing intangible capital's role in organizational development (Kaplan & Norton, 2004) and staff attitudes in change adoption (Bhattacharjee & Premkumar, 2004).

The multiple regression analysis provided critical insights. The statistically significant positive effect of Information Capital on Asset Turnover (ATO) was the most notable finding. This suggests cooperatives adept at managing and utilizing information (market, customer, operational data) achieve more efficient asset use to generate revenue. In a data-rich, technologically disruptive era, transforming information into actionable insights likely allows for optimized inventory, better supply chain management, and quicker market responses, enhancing ATO (Chen & Siau, 2012). The moderate attitude towards information capital and FGD-identified data utilization challenges suggest that while Information Capital's potential is high, its full realization is hampered; those leveraging it see tangible benefits.

Conversely, other intangible capital components (human, organizational, management) and perceptions of responsive strategies (marketing, market intelligence, logistics & distribution) did not show statistically significant direct effects on ATO in this model. This doesn't negate their importance; their influence might be indirect, mediated, or longer-term. For instance, human capital development or better marketing might improve market position, eventually impacting financial performance, but their immediate link to asset turnover efficiency may be less pronounced than Information Capital's direct operational advantages. FGDs also pointed to internal constraints and varying readiness, potentially moderating these factors' impact.

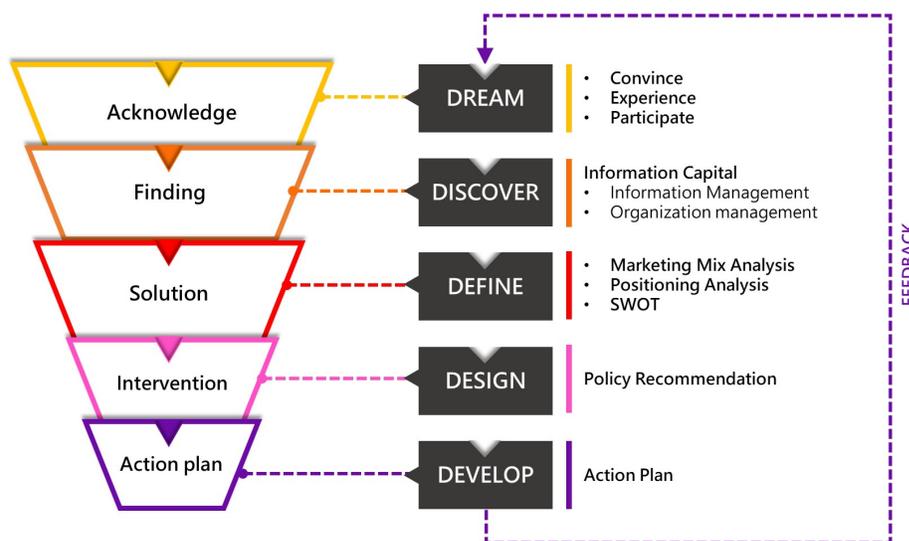
Furthermore, the overall regression models for Return on Assets (ROA) and Net Profit Margin (NPM) were not statistically significant. This implies the selected independent variables, as combined, do not sufficiently explain variations in these broader profitability measures. ROA and NPM are complex, influenced by numerous factors beyond this study's scope (e.g., pricing, costs, competition, socio-economic objectives of cooperatives). The finding that average NPM was higher

than the industry average, despite the non-significant model, suggests other unmeasured factors contribute to profitability. These regression results, particularly Information Capital's prominence for ATO, are crucial for policy recommendations.

**Key findings: 5D as an ideological framework**

Building on findings highlighting Information Capital's critical role for Asset Turnover (ATO) and cooperatives' challenges in market intelligence and strategic adaptation, this study introduces the 5D Model (Dream, Discover, Define, Design, Develop). This practical framework guides agricultural cooperatives in developing robust strategic plans that integrate technological considerations and leverage intangible assets, particularly Information Capital.

The 5D Model, a key finding of this research, is a novel strategic planning framework designed for agricultural cooperatives navigating technological disruption. It integrates Design Thinking (Brown, 2009), Organizational Development (Burke & Litwin, 1992), and Appreciative Inquiry (Cooperrider & Whitney, 2005). This research adapted the original 4D cycle by adding a "Define" stage for clearer problem identification and rephrasing "Develop" for actionable implementation. The 5D model thus offers a context-specific roadmap for cooperatives to innovate amidst digital transformation. Its stages are: (1) Dream (visioning), (2) Discover (resource assessment), (3) Define (problem definition), (4) Design (solution design), and (5) Develop (implementation and action, including monitoring). (Figure 2 illustrates this framework).



**Figure 2** Ideological Framework for Policy Recommendations

## Conclusion

This study examined factors influencing cooperative performance in Northeastern Thailand amidst technological disruption. Findings revealed that while Agricultural Cooperative Firm's Officers (ACOs) exhibit positive attitudes towards technological advancements and acknowledge the importance of responsive strategies and intangible capital, they face significant challenges in accessing, interpreting, and strategically utilizing information and market intelligence. These challenges, identified through survey data and corroborated by focus group discussions, highlighted deficiencies in data analysis capabilities and systematic information use.

Quantitative analysis identified Information Capital as a crucial, statistically significant factor enhancing Asset Turnover (ATO). Cooperatives adept at managing information demonstrated more efficient asset utilization. However, the overall regression models for Return on Assets (ROA) and Net Profit Margin (NPM) were not statistically significant, suggesting these broader profitability metrics are influenced by more extensive factors beyond this study's direct scope. While the ATO model was significant, it explained a small variance portion, indicating other unmeasured factors. Perceptions of Marketing Strategy, Market Intelligence, Logistics & Distribution, and attitudes towards Human Capital, Organizational Capital, or Management did not show significant direct effects on ATO in this model, though indirect influences are possible.

The findings underscore the importance of information literacy and data-driven decision-making. To aid cooperatives, the 5D model (Dream, Discover, Define, Design, Develop) is presented as a framework for developing strategic business plans, enabling systematic resource assessment, challenge identification, and targeted interventions.

## Recommendations

### Practical Recommendations

This study highlights the critical role of information capital in enhancing the efficiency of agricultural cooperatives. To remain competitive in a digital era, cooperatives must go beyond data collection to actively leverage it for strategic decisions. Priorities should include building strong data systems, investing in digital skills, and developing adaptive leadership. Human capacity is as vital as infrastructure staff training and cross-organizational collaboration are essential. The

5D Model (Dream, Discover, Define, Design, Develop) provides a practical guide for driving innovation and sustainable transformation.

### Theoretical Implications

The research reframes organizational transformation by emphasizing intangible assets, especially information capital, over traditional structural or financial factors. It validates the use of mixed-methods approaches to understand complex dynamics and encourages cross-sector application. The study also invites interdisciplinary inquiry, linking technology, leadership, and behavioral science, and urges scholars to focus on human adaptability in digital change.

### Future Research

Future studies should explore how external forces (e.g., policy, market trends) affect cooperative resilience. Cross-regional comparisons and larger, more diverse samples could offer broader insights. Deeper qualitative methods may reveal cultural resistance to change. There is also scope to test emerging technologies within cooperatives and to validate the 5D Model through longitudinal research.

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## Moderating Role of Internationalization and Firm Size on The Relationship between Institutional Ownership and Earnings Quality

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### Abstract

This study examines the moderating effects of internationalization and firm size on the relationship between institutional ownership and earnings quality. The sample consisted of 326 firm-year observations from four industries listed on the Stock Exchange of Thailand (SET) during the period 2017–2019. The findings revealed that institutional ownership did not have a significant effect on earnings quality. However, internationalization positively moderated this relationship, while firm size did not exhibit such an effect. Further analysis indicated that institutional ownership was positively and significantly associated with earnings quality only in firms that operated internationally and were of medium to large size. These results point to the value of effective corporate governance mechanisms, particularly for firms expanding into international markets with institutional investors as shareholders. The study contributes to a more profound understanding of the conditional factors affecting earnings quality in emerging market contexts.

**Keywords:** Earnings Quality, Institutional Ownership, Internationalization, Firm Size

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## Introduction

Financial reporting is an important aspect of business communication because it gives stakeholders, especially investors, the clear information they need to make decisions (Francis et al., 2008; Schroeder et al., 2019; White et al., 2002). However, agency theory shows how opportunistic managers can harm the credibility of reports. When shareholders (principals) allocate tasks to executives (agents), it can lead to information gaps and possible conflicts of interest (Clarke, 2004; Jensen & Meckling, 1976). These disagreements can lead to earnings management, defined as the practice of managers altering accounting numbers for their own benefit, which may ultimately harm the company's value (Healy & Wahlen, 1999).

Corporate governance tools like institutional ownership try to ensure that managers do what is best for shareholders (Anand, 2007). Institutional investors, including pension and mutual funds, possess the financial resources and expertise necessary to closely monitor companies (Bao & Lewellyn, 2017). Research from developing countries like Nigeria and India suggests that more institutional ownership leads to better earnings quality by stopping opportunistic reporting (Oyebamiji, 2021; Potharla et al., 2021). These results support the idea that institutional investors have both the motivation and the ability to look closely at how managers act, which makes financial statements more reliable (Lima et al., 2018; Solikhah et al., 2022).

However, the efficiency of institutional monitoring may depend on things like a company's level of globalization. When business goes global, it must confront more complicated and unclear rules and markets, which provide managers with more freedom to make decisions (Denis et al., 2002; Hussain et al., 2021; Welch & Luostarinen, 1988). From the perspective of an agency, this operational dispersion can raise agency expenditure, which means that monitoring needs to be stricter (Denis et al., 1999). Because of this, the size of a company's overseas operations could have a big effect on the link between institutional ownership and earnings quality (Choi, 2021). Firm size is another factor that could influence this interaction. Regulators and analysts scrutinize larger companies more closely, which can prevent them from manipulating earnings (Watts & Zimmerman, 1978). These companies also benefit from already existing governance mechanisms that can help them provide clear financial disclosures (Mutunga & Owino, 2017; Solikhah et al., 2022). Still, the evidence from studies is mixed. Some studies indicate that bigger companies have better profit quality (Purnamasari & Fachrurrozie, 2020), while

others show that size doesn't matter (Kristiawan, 2024). Therefore, a closer examination is necessary to determine whether a company's size facilitates or hinders institutional investors' ability to monitor operations.

In this context, the current study looks at how institutional ownership, internationalization, and firm size all affect the quality of earnings in the Thai corporate sector. This is a suitable place to do the study since it has a mix of companies that do business around the world and companies of different sizes. Using Conditional Process Analysis Hayes (2017), a quantitative tool that lets us look closely at these complicated connections, the study looks at the combined effects. This method makes the analysis more accurate and in-depth. The results should have real world effects on stakeholders in Thailand and other emerging countries. They should help improve company governance and make financial reporting clearer.

## Literature review

### Agency Theory

Agency theory, as proposed by Jensen and Meckling (1976), examines the principal-agent relationship within corporate structures, where owners (principals) delegate management to executives (agents). This theory explains how managers may engage in earnings management (EM) to prioritize personal interests over shareholder value. Information asymmetry and environmental uncertainties contribute to this agency problem, where agents may act contrary to principals' objectives. Effective corporate governance mechanisms, including monitoring and control frameworks, are crucial for aligning agent behavior with principal interests (Anand, 2007; Clarke, 2004).

### Earnings quality

Earnings quality is a complicated notion that includes various qualities, such as persistence, predictability, and the separation of discretionary and non-discretionary components (Schipper & Vincent, 2003). Accrual-based models are frequently used in academic literature to measure earnings quality, with the assumption that earnings include both cash flow and accrual components (Dechow et al., 2010). Accruals are important in accounting because they ensure that revenues and expenses are properly reported at the same time. However, the discretionary components of management also serve as a route for earnings management, which can distort genuine performance (Healy & Wahlen, 1999).

Accrual accounting recognizes revenues and expenses as they are received or incurred, regardless of when the cash is exchanged. This procedure requires management to make estimates and judgments. Total accruals can be divided into two categories: non-discretionary and discretionary accruals. Non-discretionary accruals are typical and expected accruals resulting from a company's business activities and influenced by its economic circumstances. Discretionary accruals, on the other hand, are the outcome of opportunistic administrative decisions in applying accounting standards (Healy, 1985; Jones, 1991). A larger degree of discretionary accruals is typically viewed as indicating lower profit quality, implying that earnings are artificially inflated or deflated.

Researchers created several models that experimentally measure discretionary accruals. Jones (1991) suggested one of the most influential and extensively used models, which was later revised by Dechow et al. (1995) into what is now known as the modified Jones model. According to the original Jones model, non-discretionary accruals are determined by changes in revenue and gross property, plant, and equipment. The model is generated using a time-series or cross-sectional regression on a sample of firms, and the residuals are used to estimate discretionary accruals. Dechow et al. (1995) discovered a flaw in the Jones model: it implies that all increases in revenue are non-discretionary. Managers, on the other hand, can manipulate profitability by extending lax credit terms to speed up revenue recognition. To address this, the modified Jones model adjusts total revenue for changes in accounts receivable. This adjustment is intended to better account for the effect of changes in a company's economic situation on nondiscretionary accruals. The model is typically specified as follows:

$$TA_{it} = NI_{it} - CFO_{it} \quad (1)$$

$$TA_{it}/A_{i,t-1} = \beta_1(1/A_{i,t-1}) + \beta_2(\Delta Rev_{it}/A_{i,t-1} - \Delta Rec_{it}/A_{i,t-1}) + \beta_3(PPE_{it}/A_{i,t-1}) + \epsilon_{it} \quad (2)$$

$$NDA_{it} = \beta_1(1/A_{i,t-1}) + \beta_2(\Delta Rev_{it}/A_{i,t-1} - \Delta Rec_{it}/A_{i,t-1}) + \beta_3(PPE_{it}/A_{i,t-1}) \quad (3)$$

$$DA_{it} = TA_{it} - NDA_{it} \quad (4)$$

Where:

$TA_{it}$  = Total accruals for firm  $i$  in year  $t$ , calculated as (Net Income - Cash Flow from Operations)

$A_{i,t-1}$  = Total assets for firm  $i$  in year  $t - 1$ .

$\Delta Rev$  = Change in revenues for firm  $i$  in year  $t$

$\Delta \text{Rec}$  = Change in net receivables for firm  $i$  in year  $t$

$\text{NDA}_{it}$  = Non-discretionary accruals of firm  $i$  in year  $t$

$\text{DA}_{it}$  = Discretionary accruals of firm  $i$  in year  $t$

### **Institutional Ownership**

Institutional investor participation has become a significant force in corporate monitoring, safeguarding minority shareholder interests (Daily et al., 2003). The substantial growth in institutional holdings has established powerful constituencies that play a crucial role in corporate governance. Specifically, institutional investors can enhance corporate governance in Asian firms by mitigating conflicts between controlling and minority shareholders (Claessens & Fan, 2002). Their resources, including expertise and active voting rights, facilitate diligent monitoring (Donnelly & Mulcahy, 2008). These institutional stakeholders often represent diverse sectors, such as insurance, banking, pension funds, and investment firms (Abd Alhadi et al., 2020).

### **Internationalization**

Internationalization, geographic diversification, international diversification, international expansion, and globalization are interrelated terms often used to describe the same strategic management construct (Hitt et al., 2006). According to Hanson et al. (2016), internationalization represented a strategic approach through which firms extend their products or services beyond domestic borders to target diverse geographic markets worldwide. This process encompasses the strategies and mechanisms companies employ to enter and establish operations in foreign nations (Welch & Luostarinen, 1988). Through internationalization, businesses can expand into new geographical territories, explore novel revenue generation opportunities, and ultimately achieve substantial financial gains (Costa et al., 2018).

### **Institutional Ownership and Earnings Quality**

Institutional shareholders, such as pension funds, investment funds, banks, and insurance companies, have considerable power due to their enormous financial commitments and greater access to information (Bao & Lewellyn, 2017). Their resources allow for more accurate profit estimates and comprehensive evaluations of corporate performance. According to research, institutional ownership has a good association with earnings quality. For example, research in

Nigeria and India suggests that institutional ownership improves monitoring, lowering earnings management and supporting the active monitoring hypothesis (Oyebamiji, 2021; Potharla et al., 2021). With large ownership, these investors adopt greater governance, resulting in higher financial reporting standards, especially in countries with lax shareholder rights (Lima et al., 2018; Solikhah et al., 2022). These data indicate that higher institutional ownership improves earnings quality by enhancing governance and reducing opportunistic accounting.

Hypothesis 1: There is a positive effect of institutional ownership on earnings quality, as proxied by discretionary accruals.

### **Moderating effect of Internationalization and Firm Size on Institutional Ownership and Earnings Quality**

#### **Internationalization**

Internationalization can facilitate the separation of ownership and control, potentially leading to agency costs if managers make decisions that negatively impact shareholders (Denis et al., 2002; Jensen & Meckling, 1976). As a result, businesses operating in various regions are more likely to have their profits manipulated due to increasing complexity. This conclusion is backed up by real-world research that shows that international diversity is linked to higher discretionary accruals and long-term profitability, which gives managers more freedom (Choi, 2021; Hussain et al., 2021). This study looks at how internationalization changes the link between institutional ownership and profit quality in Thailand. This is because cross-border complexity can make institutional monitoring less effective.

Hypothesis 2: Internationalization moderates the relationship between institutional ownership and earnings quality, as proxied by discretionary accruals.

#### **Firm Size**

Firm size, typically measured by its total assets, significantly influences the quality of its profitability. According to Positive Accounting Theory, regulators and analysts pay more attention to large companies, which leads these companies to use more conservative accounting methods that make it harder to manage earnings (Watts & Zimmerman, 1978). Larger companies can benefit from economies of scale and more institutional owners, which can lower the incentives to manipulate and encourage clear reporting (Mutunga & Owino, 2017; Solikhah et al.,

2022). There is inconsistent evidence about its direct effect (Kristiawan, 2024; Purnamasari & Fachrurrozie, 2020), although firm size has been shown to be an important factor in other corporate governance situations (Githaiga et al., 2022). Therefore, this study looks at how it works as a moderator in Thai businesses.

Hypothesis 3: Firm size moderates the relationship between institutional ownership and earnings quality, as proxied by discretionary accruals.

### **Internationalization and Firm Size effects on Institutional Ownership and Earnings Quality**

This study additionally investigates the joint moderating influence of internationalization and firm size, building on the prior ideas. Large companies operating in multiple countries face more complex rules and regulations, potentially complicating institutional oversight (Choi, 2021). But the extra attention that comes with being a big company might make up for the agency expenses that come with doing business in other countries (Denis et al., 1999; Solikhah et al., 2022). Examining these elements collectively provides a clearer understanding of how firm-level characteristics influence the impact of institutional ownership on the quality of financial reporting. This shows how complicated governance is in a worldwide economy.

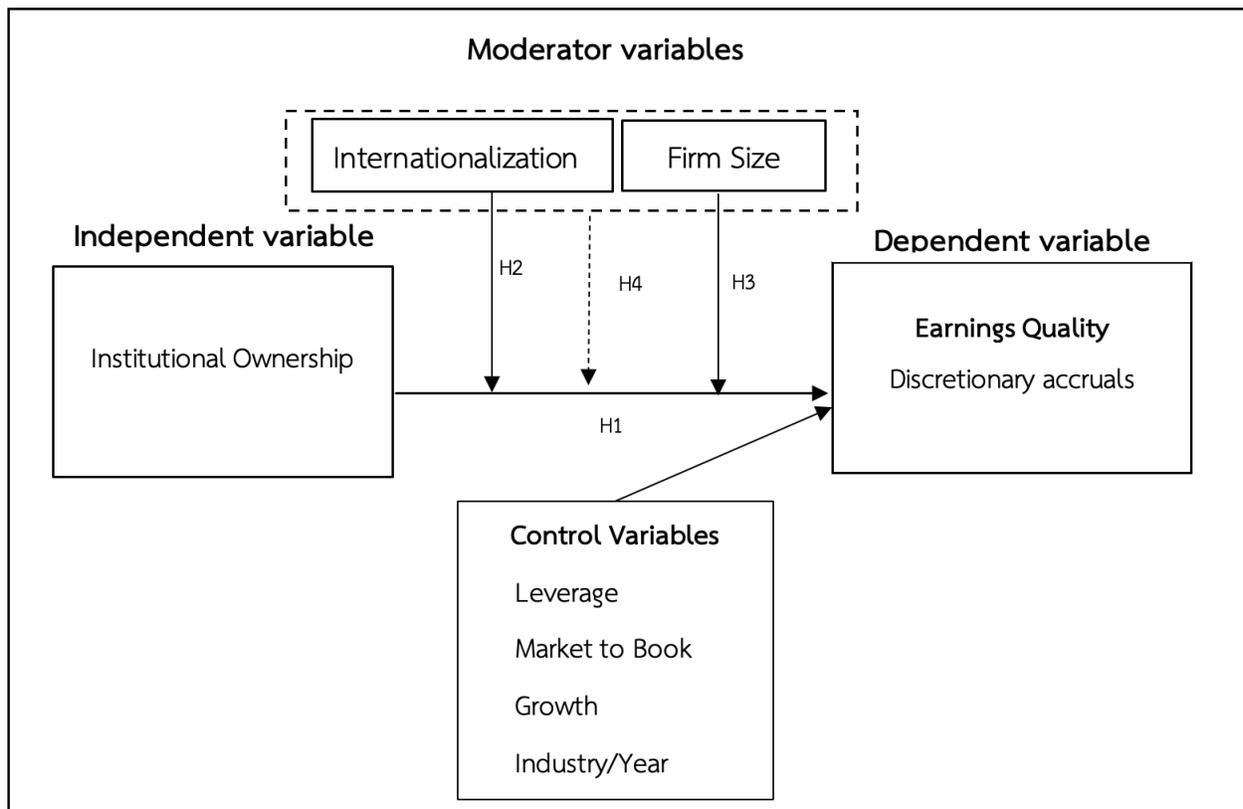
Hypothesis 4: Internationalization and Firm size moderate the relationship between institutional ownership and earnings quality, as proxied by discretionary accruals.

### **Control Variables**

**Leverage:** Firms with high leverage ratios may feel additional pressure to control their profitability so they don't break their debt covenants or obtain better terms on future loans (Yi-Mien & Tzu-Wen, 2016). Conversely, having a lot of debt can make creditors pay more attention, which could improve the quality of earnings (Muhtaseb et al., 2024). **The Market-to-Book Ratio:** Firms with many investment opportunities feel pressure from the market to keep positive expectations, which might lead them to adjust their earnings; however, having solid fundamentals can reduce the need to do so. There are several ways that sales growth affects earnings management. Rapid development could make it less tempting to cheat because strong, real performance meets the needs of stakeholders (Firnanti & Pirzada, 2019). On the other hand, slowing growth can make it harder to control profitability. Also, a history of great growth might set

high standards, which can lead to opportunistic manipulation when growth slows down as management tries to fulfill analyst projections (Naue et al., 2023). Finally, fixed effects for industry and year correct for unobserved heterogeneity. This method decreases omitted variable bias by considering industry-specific time-invariant characteristics and macroeconomic shocks that affect all businesses (Gormley & Matsa, 2014).

**Conceptual framework**



**Figure 1** Conceptual framework

The conceptual framework (Fig. 1) combines agency theory with domestically generated governance capacity. Institutional owners operate as external monitors (agency alignment), but their success is dependent on environmental complexity (international diversification) and organizational resource endowment (firm size). Internationalization raises agency costs by spreading activities across jurisdictions (Denis et al., 1999), yet bigger size can enhance both monitoring demand and available monitoring resources (Watts & Zimmerman, 1978). The model thus predicts (a) a direct monitoring effect of institutional ownership on earnings quality, (b)

amplification of this effect through overseas operations, and (c) conditional reinforcement or dilution by firm size.

## Methodology

### Data and statistical analysis

This study focuses on companies listed on the Stock Exchange of Thailand (SET) in the agricultural and food, consumer products, industrial, and technology sectors between 2017 and 2019. The main reason for choosing these four industries is that they earn a large part of their money from foreign sources compared to their total revenue, making them a good fit for studying how companies manage their earnings when they have a lot of international business. The study period of 2017-2019 was deliberately chosen to capture pre-COVID-19 conditions, thereby avoiding potential data distortions from the pandemic's unprecedented economic disruptions that could confound the analysis of normal earnings management patterns.

**Table 1** Number of samples and observations

	AGRO	CONSU	INDUS	TECH	Total
All listed companies during 2017-2019	165	108	246	108	627
Less: Unavailable or inadequate data	21	6	18	12	57
Outlier	18	4	10	8	40
Non institutional ownership	27	56	96	25	204
Final sample	99	42	122	63	326

SOURCE: Stock Exchange of Thailand

### Statistical Analysis

Descriptive statistics were employed to present the fundamental features of the dataset, and hierarchical multiple regression analysis is conducted using Hayes (2017) PROCESS macro to test the hypotheses. To mitigate multicollinearity, direct terms are mean-centered (Aiken, 1991). For two-way interactions involving a single moderator (Hypotheses 2 and 3) use PROCESS Model 1, whereas for two-way interactions involving two moderators (Hypothesis 4) use PROCESS Model 2. Additionally, the pick-a-point method is utilized to interpret the interaction effects.

### Regression Assumptions and Diagnostics

Prior to analysis, key regression assumptions were verified. Normality was confirmed through skewness (<3) and kurtosis (<10) (Kline, 2011), with transformations applied where necessary. The Durbin-Watson statistic (1.5–2.5) indicated no autocorrelation, while residual scatter plots confirmed homoscedasticity. Multicollinearity was assessed using tolerance values (near 1) and variance inflation factors (all VIF<10), confirming independence among predictors. These diagnostic checks ensured the robustness of the findings regarding ownership structures, earnings quality, and the moderating effects of internationalization and firm size.

### Measurements for the variables

**Table 2** Measurement of study variables

Variables	Acronym	Measurement
Discretionary Accruals	ABSDA	The absolute value of discretionary accruals Modified Jones Model by Dechow et al. (1995)
Institutional Ownership	INS	The proportion of total shares held by institutional investors
Internationalization	INTER	The firm's foreign sales ratio is greater than 10%; the dummy variable is 1; otherwise, 0.
Firm Size	SIZE	The natural logarithm of the firm's total assets
Leverage	LEV	The ratio of total debt divided by total assets
Market-to-book ratio	MB	The market value of equity is divided by the book value of equity at the end of the fiscal year.
Sale Growth	GROWTH	Net sales for the current period, removing net sales from the prior period, and dividing by net sales from the prior period
Industry	IN	Dummy = 1 if firm belongs to SET one-digit industry $i$ ; 0 otherwise
Year	Y	Dummy = 1 for fiscal year $t$ (2017–2019); 0 otherwise

### Model specifications

Hypothesis 1: There is a positive effect of institutional ownership on earnings quality, as proxied by discretionary accruals.

$$ABSDA = \beta_0 + \beta_1 \text{INS} + \beta_2 \text{LEV} + \beta_3 \text{MB} + \beta_4 \text{GROWTH} + \beta_j \text{Industry} + \beta_k \text{Year} + \varepsilon$$

Hypothesis 2: Internationalization moderates the relationship between institutional ownership and earnings quality, as proxied by discretionary accruals.

$$ABSDA = \beta_0 + \beta_1 \text{INS} + \beta_2 \text{INTER} + \beta_3 (\text{INS} \times \text{INTER}) + \beta_4 \text{LEV} + \beta_5 \text{MB} + \beta_6 \text{GROWTH} + \beta_j \text{Industry} + \beta_k \text{Year} + \varepsilon$$

Hypothesis 3: Firm size moderates the relationship between institutional ownership and earnings quality, as proxied by discretionary accruals.

$$ABSDA = \beta_0 + \beta_1 \text{INS} + \beta_2 \text{SIZE} + \beta_3 (\text{INS} \times \text{SIZE}) + \beta_4 \text{LEV} + \beta_5 \text{MB} + \beta_6 \text{GROWTH} + \beta_j \text{Industry} + \beta_k \text{Year} + \varepsilon$$

Hypothesis 4: Internationalization and Firm size moderate the relationship between institutional ownership and earnings quality, as proxied by discretionary accruals.

Model test by PROCESS for SPSS (model 2)

$$ABSDA = \beta_0 + \beta_1 \text{INS} + \beta_2 \text{INTER} + \beta_3 \text{SIZE} + \beta_4 (\text{INS} \times \text{INTER}) + \beta_5 (\text{INS} \times \text{SIZE}) + \beta_6 \text{LEV} + \beta_7 \text{MB} + \beta_8 \text{GROWTH} + \beta_j \text{Industry} + \beta_k \text{Year} + \varepsilon$$

## Research Results

### Descriptive statistics

**Table 3** Descriptive statistics of the variables from 2017 to 2019

Variables	Minimum	Maximum	Mean	Std.
ABSDA	0.0001	0.0998	0.0300	0.0217
INS	0.0100	0.3800	0.0797	0.0748
INTER	0	1	0.6000	0.4920
SIZE	5.6528	8.8021	6.8626	0.6072
LEV	0.0224	0.9245	0.3943	0.2240
MB	0.1300	6.9200	1.7268	1.3873
GROWTH	-0.7563	0.9864	0.0226	0.2280

Table 3 presents descriptive statistics. Discretionary accruals (ABSDA) range from 0.0001 to 0.0998, with a mean of 0.0300. Institutional ownership (INS) ranges from 0.0100 to 0.3800, averaging 0.0797. Internationalization (INTER) ranges from 0.000 to 1.000, with a mean of 0.6000. Firm size (SIZE), using logarithm transformation, ranges from 5.6528 to 8.8021, averaging 6.8626. The leverage ratio (LEV) ranges from 0.0224 to 0.9245, with a mean of 0.3943. The market-to-book ratio (MB) ranges from 0.1300 to 6.9200, averaging 1.7268. Sales growth (GROWTH) ranges from -0.7563 to 0.9864, with a mean of 0.0226.

### Research results of hypothesis

**Table 4** Pearson's correlations of variables

Variable	ABSDA	INS	INTER	SIZE	LEV	MB	GROWTH
ABSDA	1						
INS	-0.031	1					
INTER	0.077	0.048	1				
SIZE	-0.098	.240**	.135*	1			
LEV	0.018	0.014	-.139*	.348**	1		
MB	0.094	.258**	-0.088	.229**	.197**	1	
GROWTH	-0.107	-0.014	-0.088	0.084	0.034	.133*	1

**Note:** \* significance at the .05 level, \*\* significance at the .01 level

Table 4 displays the correlation matrix encompassing all dependent, independent, moderator, and control variables. The highest correlation coefficient is 0.348, suggesting that the regression model for Hypothesis 1 has no significant multicollinearity problem. Meanwhile, for Hypotheses 2 and 3, interaction terms were mean centered to further reduce multicollinearity concerns during interaction analysis.

**Table 5** Results from a regression analysis

Variable	Model I		Model II		Model III		Model IV	
	Coef.	p-value	Coef.	p-value	Coef.	p-value	Coef.	p-value
Constant	0.024*	0.000	0.022*	0.000	0.055*	0.000	0.022*	0.000
INS	-0.020	0.170	0.029	0.171	0.008	0.925	0.037	0.097

**Table 5** Results from a regression analysis (Continued)

Variable	Model I		Model II		Model III		Model IV	
	Coef.	p-value	Coef.	p-value	Coef.	p-value	Coef.	p-value
INTER			0.007*	0.024			0.001	0.509
SIZE					-0.005*	0.024	-0.005*	0.019
INS x INTER			-0.079*	0.002			-0.082*	0.003
INS x SIZE					-0.006	0.951	-0.009	0.671
LEV	0.004	0.464	0.002	0.660	0.007	0.156	0.006	0.218
MB	0.001	0.440	0.001	0.512	0.001	0.350	0.001	0.405
GROWTH	-0.009	0.054	-0.011*	0.020	-0.008	0.071	-0.010*	0.032
Industry, Year Effect	yes		yes		yes		yes	
R <sup>2</sup> Adjusted	0.314		0.331		0.325		0.340	
VIF	1.067-2.603		1.088-2.665		1.091-2.624		1.114-2.876	
F-statistics	17.567*		15.601*		15.200*		13.933*	
Durbin-Watson	1.965		1.960		1.968		1.985	
Observations	326		326		326		326	

**Note:** \* significance at the .05 level

Table 5 summarizes the regression analysis examining whether internationalization (INTER) and firm size (SIZE) moderate the relationship between institutional ownership (INS) and earnings quality (proxied by discretionary accruals, ABSDA). Overall, the model is acceptable, with  $F = 13.933$  ( $p < .05$ ), a Durbin-Watson statistic of 1.985, and an adjusted  $R^2$  of 0.340.

To test Hypothesis 1, Model I focuses on the direct effect of INS on ABSDA. The coefficient for INS is -0.020 ( $p > .05$ ), indicating no statistically significant relationship; therefore, institutional ownership does not predict earnings quality, and Hypothesis 1 is not supported.

Turning to Hypothesis 2, which proposes that internationalization strengthens the impact of INS on ABSDA, Model II shows a significant interaction term (INS x INTER) with a coefficient of -0.079 ( $p < .05$ ). This result implies that the effect of institutional ownership on

earnings quality is more pronounced for firms engaged in international operations, offering support for Hypothesis 2.

For Hypothesis 3, the study hypothesizes that larger firms enhance the relationship between INS and ABSDA. However, Model III reveals an interaction coefficient of -0.006 ( $p > .05$ ), indicating no moderating effect of firm size. Consequently, Hypothesis 3 receives no empirical support.

Lastly, Model IV incorporates both moderators simultaneously. The interaction of INS and INTER (INS  $\times$  INTER) remains significant with a coefficient of -0.082 ( $p < .05$ ), whereas the INS and SIZE interaction (INS  $\times$  SIZE) shows no significance at -0.009 ( $p > .05$ ). This result implies that the effect of institutional ownership on earnings quality is more pronounced for firms engaged in international operations. This result implies that the effect of institutional ownership on earnings quality is more pronounced for firms engaged in international operations, but firm size has no moderating effect.

**Further analysis: Moderating the effect of both internationalization and firm size on the relationship between institutional ownership and discretionary accruals**

According to the results for Model IV, the interaction between INS and INTER is significant at -0.082 ( $p = .0028$ ), while the interaction between INS and SIZE is not significant at -0.009 ( $p = .6712$ ). To further analyze how internationalization and firm size function as moderating variables that shape discretionary accruals, we will use PROCESS Model 2 (see Table 6). The combined influence of the two interaction terms contributes 1.85% to the variance in earnings quality ( $F(2, 312) = 4.5729, p < .05$ ).

**Table 6** Output from the PROCESS macro for the interaction effect of institutional ownership (INS), internationalization (INTER), and firm size (SIZE) on discretionary accruals (ABSDA)

Model Summary							
R	R <sup>2</sup>	MSE	F	df1	df2	p	
.6061	.3673	.0003	13.9335	13	312	.0000	
Test(s) of highest order unconditional interaction (s):							
		R <sup>2</sup> -change	F	df1	df2	p-value	
X x W		0.0184	9.0762	1	312	.0028	

**Table 6** Output from the PROCESS macro for the interaction effect of institutional ownership (INS), internationalization (INTER), and firm size (SIZE) on discretionary accruals (ABSDA) (Continued)

<b>Test(s) of highest order unconditional interaction (s):</b>							
		R <sup>2</sup> -change	F	df1	df2	p-value	
X x Z		0.0004	0.1805	1	312	.6712	
BOTH		0.0185	4.5729	2	312	.0110	

**Focal predict: INS (X), Mod var: INTER (W), Mod var: SIZE (Z)**

**Conditional effects of the focal predictor at values of the moderator(s):**

INTER	SIZE	Effect	SE	t-value	p-value	LLCI	ULCI
No	Small	0.0427	0.0286	1.4962	.1356	-0.0135	0.0989
No	Average	0.0373	0.0224	1.6667	.0966	-0.0067	0.0813
No	Large	0.0319	0.0226	1.4078	.1602	-0.0127	0.0764
Yes	Small	-0.0392	0.0250	-1.5633	.1190	-0.0884	0.0101
Yes	Average	-0.0446	0.0187	-2.3839	.0177*	-0.0814	-0.0078
Yes	Large	-0.0500	0.0200	-2.5049	.0128*	-0.0893	-0.0107

Table 6 presents the conditional impact of institutional ownership on earnings quality, considering different levels of internationalization and firm size. Notably, institutional ownership significantly affects earnings quality in two specific contexts: (1) among internationalized firms of average size (Effect = -0.0446,  $p < 0.05$ ) and (2) among internationalized firms of larger size (Effect = -0.0500,  $p < 0.05$ ). In contrast, when firms are not internationalized regardless of size (Effects = 0.0427, 0.0373, 0.0319,  $p > 0.05$ ) or when they are internationalized but small (Effect = -0.0392,  $p > 0.05$ ), the effect of institutional ownership on earnings quality is statistically insignificant.

## Discussion

This study investigated the moderating effects of internationalization and firm size on the relationship between institutional ownership and earnings quality in the Thai corporate sector. The first hypothesis (H1) of a direct, positive association between institutional ownership and earnings quality was not validated. This conclusion contradicts earlier studies in other emerging markets, where institutional investors have been shown to effectively constrain earnings

management (Oyebamiji, 2021; Potharla et al., 2021). In support of Hypothesis 2, the study found that internationalization significantly modifies the relationship between institutional ownership and earnings quality. This finding is consistent with the agency theory perspective, which holds that international expansion increases operational complexity and information asymmetry, raising agency costs (Denis et al., 1999; Denis et al., 2002). In such situations, institutional investors' sophisticated monitoring and expertise become more crucial and, as the findings show, more effective in limiting opportunistic managerial conduct (Hussain et al., 2021). In contrast, Hypothesis 3, which postulated a moderating influence for company size, was not supported. The relationship between institutional ownership and firm size was insignificant. This finding is consistent with previous research that revealed no significant influence of firm size on earnings quality (Kristiawan, 2024), but it differs from other research that suggests larger organizations produce higher quality earnings (Purnamasari & Fachrurrozie, 2020). The result means that, in the context of this investigation, scalability does not increase or decrease institutional investors' monitoring effectiveness.

The most convincing findings came from the conditional process analysis (H4), which examined the cumulative moderating effects. The relationship between institutional ownership and greater earnings quality was shown to be significant only under specified conditions: in firms that are both internationalized and of average or large size. For non-internationalized enterprises (of any size) and tiny internationalized firms, the monitoring effect of institutional ownership was statistically insignificant. This unexpected discovery suggests a synergistic impact. Jensen and Meckling (1976) assert that increased agency risks resulting from internationalization necessitate strong monitoring. Institutional investors, on the other hand, can efficiently supervise larger firms due to their visibility, resources, and established governance processes (Mutunga & Owino, 2017; Watts & Zimmerman, 1978). In conclusion, institutional shareholders' monitoring capacity is most successful when agency problems are complex (international operations) and the governance platform is adequate for larger firms.

## Conclusion

This study suggests that institutional ownership's usefulness as a corporate governance strategy for ensuring earnings quality is context-dependent, rather than universal. In the Thai

enterprises studied, there is no strong, direct association between institutional holdings and discretionary accruals. Instead, institutional investors' monitoring function is engaged, and it is most effective in large, internationally diverse enterprises. The study demonstrates how the interplay between a company's operational scope (internationalization) and structural scale (size) influences financial reporting outcomes. These findings suggest to investors and analysts that simply examining the level of institutional ownership is insufficient; its impact must be considered in conjunction with the firm's strategic and structural characteristics. This study emphasizes the importance of developing governance frameworks that consider the specific issues and complexities that large, globalizing organizations face.

### **Contribution**

**Theoretical Contribution:** The study extends agency theory beyond simple, direct links. It indicates that the effectiveness of a major governance tool, institutional ownership, varies. By using a conditional process model, it shows that the way institutional ownership monitors are affected by having both internationalization and a large firm size at the same time. This study offers a more sophisticated and realistic model of corporate governance, illustrating that the impact of external monitors is contingent on a complex interplay of organizational factors that influence agency costs and monitoring efficiency (Denis et al., 2002; Jensen & Meckling, 1976).

**Empirical Contribution:** The core empirical finding is novel: institutional ownership significantly improves earnings quality only for firms that are both internationalized and large. Previous studies have frequently studied these factors in isolation (Choi, 2021; Githaiga et al., 2022). This study is among the first to demonstrate their combined, synergistic effect, providing a specific, data-driven answer to the question of when institutional investors are most effective.

**Methodological Contribution:** Using the Hayes (2017) PROCESS macro (Model 2) to examine a conditional moderation model about corporate governance in a developing market is a valuable addition to the research. This strong statistical method enables a clearer and more detailed look at complicated interactions compared to regular regression models, serving as a useful guide for future finance and accounting research.

## Limitations and Future Research

This study's limitations present opportunities for future research. The sample was limited to four industries on the Stock Exchange of Thailand, potentially limiting generalizability to other sectors like banking or services with different regulatory environments. The years 2017 to 2019 were chosen to avoid the impact of COVID-19, but this limits how the findings can be applied during crises, indicating that future research could compare the effects of economic shocks on institutional ownership and earnings quality before, during, and after the pandemic. Furthermore, the way internationalization is measured (using a 10% foreign sales threshold) and the single approach to institutional ownership overlook significant differences. Future research could use more detailed internationalization measures and distinguish between types of institutional investors (such as domestic vs. foreign and long-term vs. short-term) to better understand their different levels of oversight and motivations.

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# The Influence of Entrepreneurial Orientation on Firm Performance: The Mediating Role of Learning Orientation in Small and Medium-Sized Enterprises

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## Abstract

This study aimed to examine the influence of entrepreneurial orientation (EO) on learning orientation (LO) and firm performance (FP) in small and medium-sized enterprises (SMEs). Additionally, the research sought to validate a causal relationship model linking EO, LO, and SME performance. Data were collected through a structured questionnaire administered to 372 SME respondents. The analysis employed both descriptive statistics (percentage, mean, and standard deviation) and inferential statistics using Structural Equation Modeling (SEM) via the AMOS software. The goodness-of-fit indices indicated that the model was consistent with the empirical data (Chi-square/df = 1.32, CFI = 0.975, TLI = 0.966, RMSEA = 0.041, SRMR = 0.038). The findings revealed that: (1) EO, comprising innovativeness, proactiveness, risk-taking, autonomy, and competitive aggressiveness, had a significant positive effect on SME performance; (2) EO positively influenced LO; (3) LO had a positive impact on SME performance; and (4) EO influenced SME performance both directly and indirectly through LO. These findings provide practical implications for SMEs by emphasizing the importance of fostering an entrepreneurial mindset and a learning-oriented culture—particularly in promoting innovation—as a means to enhance organizational performance and competitiveness.

**Keywords:** Entrepreneurial orientation, Learning orientation, Firm performance

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## Introduction

Entrepreneurs are widely recognized as key drivers of economic growth, particularly during periods of global economic slowdown and heightened uncertainty (United Nations, 2025). In this context, academic inquiries aimed at identifying the determinants of business success or failure become increasingly critical. Among the various conceptual frameworks, Entrepreneurial Orientation (EO) has attracted substantial scholarly attention as a strategic approach that significantly influences organizational performance. Rauch et al. (2009) asserted that EO is directly associated with firm performance (FP), as it provides a framework to guide strategic decision-making and entrepreneurial behavior. This perspective is further supported by Nulkar (2014), who argued that small and medium-sized enterprises (SMEs) adopt EO as a strategic planning tool to navigate dynamic environments and overcome crises affecting business operations.

In recent years, EO and its constituent dimensions have been extensively explored, particularly in relation to strategic value creation and the development of competitive advantage (Chen et al., 2023). A core element underpinning the sustainability of organizational competitiveness is innovation capability—a fundamental component of EO (Górska-Warsewicz, 2024). This capability can be cultivated through organizational systems and cultures that promote the acquisition, dissemination, and application of market and environmental knowledge. These knowledge processes foster both learning and innovation, thereby enhancing a firm's competitive positioning and overall success (Agazu & Kero, 2024).

In this regard, learning orientation (LO) plays a pivotal role in facilitating innovation within firms, as innovation is often the result of ongoing learning processes essential to contemporary business operations. Firms that exhibit strong learning capabilities are more likely to deliver superior customer service, maintain consistent quality standards, and achieve sustainable profitability (Alerasoul et al., 2022). Although the positive association between learning and organizational performance has been well documented, the specific mechanisms and contextual conditions that enable this relationship remain insufficiently understood. Several studies suggest that a firm's risk-taking propensity enhances its innovation capacity, which in turn contributes to improved entrepreneurial performance (Giaccone & Magnusson, 2022; Mata et al., 2024). In this vein, Amin (2015) found that EO correlates with innovation intention, risk-seeking behavior, and

opportunity creation—all of which significantly influence SME performance. The same study also emphasized that LO is a crucial determinant of SME survival.

An effective learning process is thus closely intertwined with both innovation and organizational performance. It serves as a strategic resource that enables small firms to achieve operational efficiency, pursue growth objectives, and secure competitive advantage (Nasir et al., 2017). A growing body of research affirms that LO enhances SME performance by fostering organizational growth, deepening customer understanding, and cultivating customer loyalty—key factors that collectively lead to sustained business success (Mohammad, 2019; Dangosu, 2024).

Despite the growing interest in the interplay between EO, LO, and FP, a clear theoretical articulation of how these constructs interact—especially within the SME context of emerging economies—remains underdeveloped. Most empirical studies have predominantly focused on Western or developed nations, where institutional and market dynamics differ significantly from those in developing regions (Real et al., 2014). As such, there is a pressing need for empirical investigations that contextualize these strategic orientations within non-Western economies such as Thailand, where SMEs form the backbone of the national economy yet face unique challenges related to innovation, learning infrastructure, and strategic agility.

This study seeks to address this gap by offering three key contributions to the existing body of literature. First, it investigates both the direct and indirect relationships among EO, LO, and FP, thereby providing a more nuanced understanding of the mediating role of LO in translating entrepreneurial behaviors into tangible performance outcomes. Second, the research centers on small and medium-sized enterprises (SMEs) in Thailand, presenting a geographically and culturally distinctive context that adds depth to the global discourse on entrepreneurial strategy. Third, by employing Structural Equation Modeling (SEM), the study empirically validates a conceptual framework that links entrepreneurial strategic orientation with dynamic learning capabilities and firm performance.

## Literature Review

### Firm Performance (FP)

Firm performance refers to the outcomes achieved through an organization's strategic choices and management practices, utilizing its available resources, knowledge, and capabilities. It

represents a core dimension of overall organizational effectiveness and is typically assessed relative to the objectives and goals established by the firm (Delen et al., 2013). According to Wiklund and Shepherd (2005), performance in SMEs reflects the enhancement of multidimensional capabilities, forming an essential part of broader organizational effectiveness aimed at achieving sustained success.

Rauch et al. (2009) categorize firm performance into two primary dimensions: financial and non-financial. Financial performance encompasses indicators such as profitability, return on investment, and working capital ratio, which are commonly derived from financial statements and analyzed over time to assess business growth. In contrast, non-financial performance includes metrics such as market share expansion, customer satisfaction, and the fulfillment of strategic organizational objectives.

In essence, firm performance serves as a comprehensive indicator of a firm's ability to realize its vision, mission, and strategic intentions. Evaluating performance across both financial and non-financial dimensions provides insight into the organization's competitive positioning and operational effectiveness.

### **Entrepreneurial Orientation (EO)**

Entrepreneurial orientation has emerged as a critical strategic concept, encapsulating a firm's practices, decision-making approaches, and behavioral patterns that foster competitive and innovative operations (Lomberg et al., 2017). It is particularly important for SMEs, enabling them to implement proactive strategies, stimulate innovation, and enhance their operational efficiency and competitiveness (Ključnikov et al., 2019). Lumpkin and Dess (1996) conceptualize EO through five key dimensions: (1) innovativeness, (2) proactiveness, (3) risk-taking, (4) autonomy, and (5) competitive aggressiveness.

Empirical research underscores the significance of EO for business performance. Liew et al. (2025) identify entrepreneurial competency as an intangible yet valuable resource that contributes to the sustainable performance of Malaysian SMEs. Aftab et al. (2024) similarly report a positive association between EO and SME performance in Pakistan, with innovation, proactiveness, and risk-taking emerging as critical determinants. These findings are consistent with the study by Kraus et al. (2012), which confirms a strong correlation between EO and firm performance among Dutch

SMEs, and are further corroborated by Yang and Aumeboonsuke (2022) as well as He and Puttawong (2024), who found parallel results in the context of Chinese entrepreneurs.

Moreover, firms exhibiting high levels of EO are more likely to adopt a learning-oriented culture, emphasizing openness to new knowledge, commitment to continuous learning, and alignment through a shared organizational vision (Wang, 2008). Gomes et al. (2022) provide empirical support for the positive influence of EO on learning orientation. In line with this, Alyammahi et al. (2024) assert that entrepreneurial behavior enhances creative learning, expands opportunity recognition, and improves overall business outcomes. Allameh and Khalilakbar (2018) further confirm the significant impact of EO on LO in the context of Iranian SMEs. Based on the reviewed literature, the following hypotheses are proposed:

H1: Entrepreneurial orientation has a positive influence on firm performance.

H2: Entrepreneurial orientation has a positive influence on learning orientation.

### **Learning Orientation (LO)**

Learning orientation reflects an organization's fundamental stance toward learning and the strategic role of leadership in promoting learning processes. It can be viewed as a cultural attribute that shapes a firm's capacity to generate, share, and apply knowledge (Amin, 2015). According to Tho (2019), LO encompasses organizational efforts to search for, acquire, and develop knowledge, which are critical to driving innovation and fostering business transformation. Synthesizing prior research, Calantone et al. (2002) identify four key dimensions of LO: (1) commitment to learning, (2) shared vision, (3) open-mindedness, and (4) intra-organizational knowledge sharing.

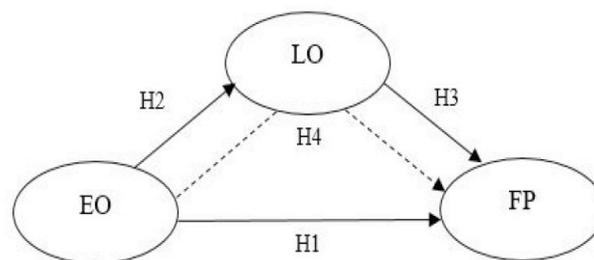
LO is vital for organizational development, as it enhances firms' adaptive capabilities and supports strategic decision-making. Sukma (2024) finds that LO has a significant and positive impact on SME performance, enabling firms to maximize efficiency, exploit competitive advantages, and create superior customer value, which in turn facilitates market expansion and improved performance. In a similar vein, Hakim and Wijaya (2022) demonstrate that LO positively affects the performance of micro and small enterprises (MSMEs) in Indonesia, primarily by enhancing innovation through knowledge-based strategies and creative idea generation.

Further supporting this view, Meekaewkunchorn et al. (2021) highlight the mediating role of LO and business strategy in reinforcing the resource-based view (RBV), thereby offering practical

insights for the formulation of managerial policies aimed at boosting firm performance. Complementing this perspective, Real et al. (2014) provide empirical evidence that LO partially mediates the relationship between EO and performance, underscoring LO's role in converting entrepreneurial strategies into measurable outcomes. Accordingly, the following hypotheses are developed:

H3: Learning orientation has a positive influence on firm performance.

H4: Learning orientation mediates the relationship between entrepreneurial orientation and firm performance.



**Figure 1** Conceptual Framework

## Methodology

This study adopted a quantitative research design, utilizing a survey method to collect data from the target population. The population comprised entrepreneurs of small and medium-sized enterprises (SMEs) in the manufacturing sector located in Bangkok and its surrounding metropolitan areas. These entrepreneurs were registered with the Office of Small and Medium Enterprises Promotion (OSMEP), with the total population amounting to 29,532 individuals. The selected geographical area was chosen due to its high concentration of SMEs, ranking among the top nationwide in terms of entrepreneurial activity (OSMEP, 2024).

The appropriate sample size was determined using Yamane's (1973) formula for a known population, applying a 95% confidence level and a 5% margin of error, which resulted in a required sample of 395 respondents. Additionally, the 20:1 rule of thumb for Structural Equation Modeling (SEM) was applied, based on the inclusion of 12 observed variables, thereby suggesting a minimum of 240 responses. The final sample of 395 respondents exceeded this threshold and was therefore considered sufficient and appropriate for conducting SEM analysis.

A non-probability sampling method, specifically accidental (convenience) sampling, was employed to recruit participants. Questionnaires were distributed to SMEs between October and December 2024, and 372 valid responses were returned, representing a response rate of 74.40%. All returned questionnaires were screened for completeness and accuracy prior to analysis.

The research instrument was a structured questionnaire, developed based on an extensive review of relevant academic literature and prior empirical studies. The instrument was designed to measure the key latent constructs, including the external latent variable—Entrepreneurial Orientation (EO), and the internal latent variables—Learning Orientation (LO) and Firm Performance (FP). Responses were measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), to assess participants' agreement levels with each statement.

To ensure content validity, the questionnaire was reviewed by three subject-matter experts. The Index of Item-Objective Congruence (IOC) for all items exceeded the acceptable benchmark of 0.60, confirming adequate alignment with the intended constructs. Additionally, the reliability of the instrument was assessed using Cronbach's Alpha Coefficient. The reliability coefficients for EO, LO, and FP were 0.885, 0.903, and 0.872, respectively—all surpassing the recommended threshold of 0.70 (Hair et al., 2010), indicating a high level of internal consistency.

Descriptive statistics were employed to analyze the demographic characteristics of the respondents, including gender, age, educational background, managerial position, business size, and duration of business operation, with results presented in terms of frequencies and percentages. To examine the proposed hypotheses, inferential statistical techniques were applied, including causal modeling, to assess both direct and indirect effects among the studied variables.

## Results

Based on the demographic analysis, the majority of respondents were male. Of the total 372 participants, 254 (68.28%) were male, while 118 (31.72%) were female. Regarding age, 146 respondents (39.25%) were between 40 and 50 years old. In terms of education, 198 respondents (53.23%) held a bachelor's degree. Most respondents, 284 (76.34%), owned their businesses. Additionally, 102 participants (27.42%) reported having 15 to 20 years of entrepreneurial experience.

The preliminary analysis of the 12 observed variables utilized in this study is presented in Table 1. The results indicate the mean scores, standard deviations, and interpretations for each construct.

**Table 1** Preliminary Analysis of Observed Variables

Variable	Mean	SD	Interpretation
Entrepreneurial Orientation (EO)	4.12	0.789	High
Learning Orientation (LO)	4.03	0.724	High
Firm Performance (FP)	4.05	0.696	High

As shown in Table 1, respondents reported high levels of agreement across all variables. Firm performance received the highest mean score, followed by learning orientation and entrepreneurial orientation.

For Entrepreneurial Orientation (EO), the mean score of 4.12 indicates a high level of agreement. Respondents emphasized organizational encouragement of creativity and innovation, with particular attention given to technological advancement. Proactiveness was also noted as a key factor, especially through the development and promotion of technologically-oriented products.

Learning Orientation (LO) also exhibited a high mean score of 4.03. The findings suggest that cultivating a strong organizational learning culture was highly valued. Knowledge sharing across departments emerged as the second most important aspect.

In terms of Firm Performance (FP), the highest mean score of 4.05 reflects a strong level of agreement. Among the performance indicators, non-financial measures—specifically customer satisfaction—were rated the highest. Financial indicators, such as profitability, followed closely behind.

**Table 2** Construct reliability and Convergent validity

Construct	No. of Items	Cronbach's Alpha	CR	AVE	Factor Loading
EO	5	0.763	0.908	0.698	0.729 – 0.868
LO	4	0.852	0.891	0.745	0.742 – 0.882
FP	3	0.867	0.910	0.718	0.755 – 0.854

**Note:** \*\*p < 0.01, EO = Entrepreneurial Orientation; LO = Learning Orientation; FP = Firm Performance

The reliability of the instrument, which reflects internal consistency, was evaluated using Cronbach’s Alpha and Composite Reliability (CR). As shown in Table 2, all constructs had Cronbach’s Alpha values exceeding 0.700 and CR values ranging from 0.891 to 0.910—exceeding the 0.600 threshold. These results confirm the internal consistency of the constructs. The Average Variance Extracted (AVE) ranged from 0.698 to 0.745, which is above the 0.5 benchmark, indicating that the indicators adequately represented their respective latent variables. Moreover, all factor loadings were greater than 0.70 (ranging from 0.729 to 0.882), confirming the appropriateness of the measurement model. According to Hair et al. (2014), acceptable reliability thresholds are CR > 0.7 and AVE > 0.5, which were met in this study. These results confirm the model’s suitability for structural equation modeling (SEM) analysis.

**Table 3** Discriminant Validity

Construct	R <sup>2</sup>	AVE	Cross Construct Correlation		
			TL	CM	CR
EO		0.698	<b>0.780</b>		
LO	0.62	0.745	0.565**	<b>0.766</b>	
FP	0.70	0.718	0.512**	0.473*	<b>0.769</b>

Note: \*p < 0.05, \*\*p < 0.01

Based on Table 3, the analysis of discriminant validity revealed that the square roots of the AVE values for each construct were greater than their corresponding cross-construct correlations in the same columns. This indicates that the measurement model demonstrates discriminant validity across all constructs. In other words, each construct shares more variance with its indicators than with other constructs, confirming that the indicators reflect distinct latent variables and do not overlap with unrelated constructs. The results confirm that the square roots of the AVE values (shown diagonally in bold) are higher than the corresponding cross-construct correlation values in their respective columns. This supports the discriminant validity of the measurement model, in line with the criteria proposed by Fornell and Larcker (1981), ensuring that each construct measures a unique conceptual domain.

From figure 2, The analysis revealed that the causal relationship model demonstrated a good fit with the empirical data. The model fit indices were as follows: Relative Chi-square

(CMIN/df) = 1.323, Comparative Fit Index (CFI) = 0.975, Tucker Lewis Index (TLI) = 0.966, Root Mean Square Error of Approximation (RMSEA) = 0.041, and Standardized Root Mean Square Residual (SRMR) = 0.038. All indices met the acceptable criteria (CMIN/df < 5.00, CFI ≥ 0.95, TLI ≥ 0.95, RMSEA < 0.08, SRMR < 0.08, and p-value > 0.05), as recommended by Hair et al. (2010). These results confirm that the structural model is well-aligned with the empirical data, supporting the research hypotheses.

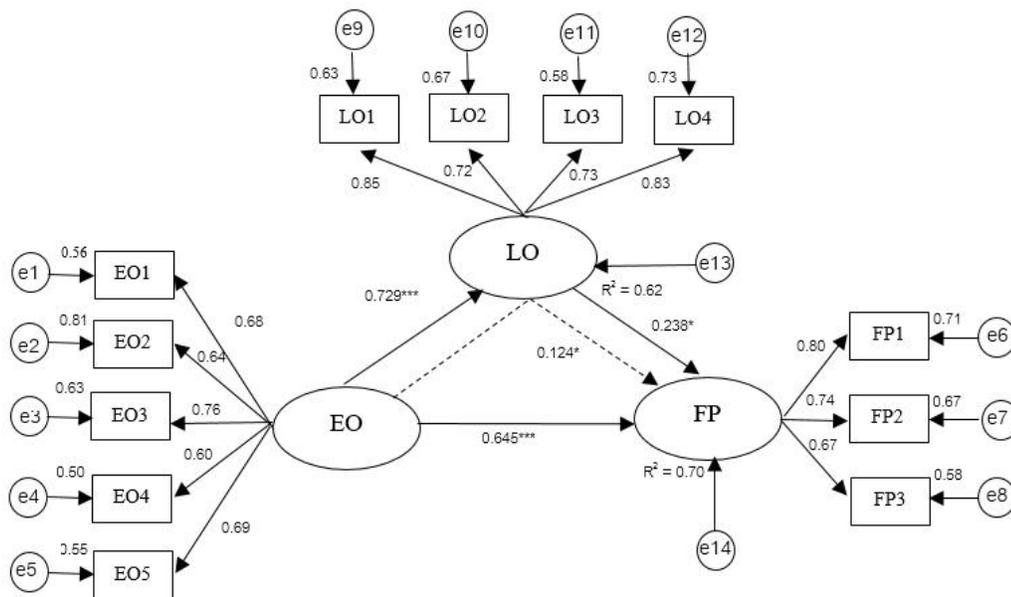


Figure 2 Results of Structural Equation Modeling Analysis

Note: \*p < 0.05 indicates statistical significance at the 0.05 level; \*\*p < 0.001 indicates statistical significance at the 0.001 level.

Table 4 Direct, Indirect, and Total Effects

Independent Variables	Dependent Variables					
	LO			FP		
	DE	IE	TE	DE	IE	TE
EO	0.729***	-	0.729***	0.645***	0.124*	0.769***
LO	-	-	-	0.238*	-	0.238*

Note: \*p < 0.05, \*\*\*p < 0.001, DE = Direct effect, IE = Indirect effect, TE = Total effect

The results of the path analysis based on the structural equation model, which satisfied the model fit criteria, are presented in Table 4. The findings illustrate both the direct and indirect

effects among the variables: Entrepreneurial Orientation (EO), Learning Orientation (LO), and Firm Performance (FP) in Thai SMEs. As shown in Table 4, EO exerted a statistically significant direct effect on LO, with a path coefficient of 0.729. EO also had a significant direct effect on FP ( $\beta = 0.645$ ) and an indirect effect via LO ( $\beta = 0.124$ ), resulting in a total effect of 0.769. Furthermore, LO had a significant direct effect on FP ( $\beta = 0.238$ ), indicating its role as a partial mediator in the relationship between EO and FP.

**Table 5** Results of Hypothesis Testing

Hypothesis	Structural Relationship	$\beta$	t-value	p-value	Hypothesis Testing
H1	EO $\rightarrow$ FP	0.645***	12.182	.000	Supported
H2	EO $\rightarrow$ LO	0.729***	20.414	.000	Supported
H3	LO $\rightarrow$ FP	0.238*	3.648	.040	Supported
H4	EO $\rightarrow$ LO $\rightarrow$ FP	0.124*	3.219	.040	Supported

**Note:** \* $p < 0.05$ , \*\*\* $p < 0.001$ .

As shown in Table 5, the results of the hypothesis testing through structural equation modeling are summarized as follows:

The findings provide empirical support for all four hypotheses:

H1: Entrepreneurial Orientation (EO) had a significant positive effect on Firm Performance (FP) ( $\beta = 0.645$ ,  $t = 12.182$ ,  $p < 0.001$ ), supporting Hypothesis 1.

H2: EO significantly influenced Learning Orientation (LO) ( $\beta = 0.729$ ,  $t = 20.414$ ,  $p < 0.001$ ), supporting Hypothesis 2.

H3: LO significantly influenced FP ( $\beta = 0.238$ ,  $t = 3.648$ ,  $p < 0.05$ ), thus supporting Hypothesis 3.

H4: LO served as a mediating variable in the relationship between EO and FP. The indirect effect of EO on FP through LO was statistically significant ( $\beta = 0.124$ ,  $t = 3.219$ ,  $p < 0.05$ ), supporting Hypothesis 4.

These findings highlight the critical roles of both entrepreneurial and learning orientations in enhancing firm performance, emphasizing the importance of fostering a learning-driven and innovation-oriented organizational culture within SMEs.

## Discussion

The present study examined the structural relationships among entrepreneurial orientation (EO), learning orientation (LO), and firm performance in the context of small and medium-sized enterprises (SMEs) in Thailand. The findings provide empirical support for all hypothesized relationships and offer several theoretical and practical implications.

First, the study demonstrates that entrepreneurial orientation has a direct and positive impact on SME performance. This relationship reflects the ability of entrepreneurially oriented firms to recognize and exploit emerging market opportunities through innovation, agility, and strategic risk-taking. EO drives the pursuit of novel solutions, enhances market responsiveness, and supports operational efficiency, all of which contribute to improved organizational outcomes. Lumpkin and Dess (1996) emphasized that EO is critical for business success as it informs strategic direction and enhances competitive positioning through innovation and proactive behavior. These findings are in line with those of Kraus et al. (2012), Yang and Aumeboonsuke (2022), and Aftab et al. (2024), who found that innovation and strategic risk-taking are key contributors to SME performance. Entrepreneurially oriented firms are not only more likely to introduce new products and services but also to maintain a strong focus on customer needs and satisfaction, which in turn leads to both financial gains and enhanced firm reputation.

Second, the results indicate that entrepreneurial orientation exerts a significant positive influence on learning orientation. EO, which encompasses dimensions such as innovativeness, proactiveness, risk-taking, autonomy, and competitive aggressiveness, fosters an environment that promotes organizational learning. Firms with high levels of EO are characterized by a strong emphasis on creativity, experimentation, and proactive behaviors, all of which stimulate continuous knowledge acquisition and learning within the organization. This finding is consistent with Liew et al. (2025), who posited that entrepreneurial behavior encourages members at all levels to engage in adaptive learning processes in response to dynamic external environments. Similarly, Kraus et al. (2012) argued that EO enhances the learning capacity of SMEs, particularly through innovation-focused learning mechanisms. Furthermore, studies by Gomes et al. (2022) and He and Puttawong (2024) corroborate that entrepreneurial firms actively nurture a culture that values learning, shared vision, openness to change, and proactive engagement with markets. These firms tend to develop capabilities that enable them to continuously analyze and respond

to shifts in the business environment, thus reinforcing the strategic importance of learning as a core organizational competency.

Third, the results confirm that learning orientation significantly and positively influences firm performance. Organizations that prioritize learning are better equipped to make informed decisions, develop effective marketing and management strategies, and deliver value to customers. This supports the view of Tho (2019), who argued that learning processes enhance organizational capabilities and performance across various domains. A strong LO enables firms to acquire, assimilate, and apply knowledge effectively, which contributes to both short-term efficiencies and long-term competitiveness. These findings are consistent with Calantone et al. (2002) and Hakim and Wijaya (2022), who identified learning orientation as a determinant of organizational performance. Specifically, LO facilitates structural learning—where outdated processes are replaced with innovative practices—leading to the development of unique capabilities in knowledge creation, innovation, and strategic adaptation. These outcomes are linked to both tangible performance indicators, such as increased profitability, and intangible indicators, such as customer loyalty and expanded market share.

Lastly, the study identifies a significant indirect effect of EO on firm performance through LO, with an indirect effect value of 0.124. This finding suggests that learning orientation partially mediates the relationship between entrepreneurial orientation and performance. EO not only influences performance directly but also fosters a learning environment that enhances the firm's ability to translate entrepreneurial strategies into actionable and effective outcomes. This mediating role of LO supports the findings of Real et al. (2014) and Meekaewkunchorn et al. (2024), who demonstrated that LO serves as a critical mechanism through which entrepreneurial intent is transformed into improved organizational performance. The presence of both direct and indirect effects reinforces the strategic importance of integrating EO and LO within SME development frameworks. Firms that simultaneously cultivate entrepreneurial behaviors and learning capabilities are better positioned to adapt, innovate, and sustain competitive advantages in complex and evolving market environments.

In sum, the findings emphasize that entrepreneurial orientation and learning orientation are not only interrelated but also collectively contribute to the performance and long-term

viability of SMEs. Developing a synergistic approach that promotes both EO and LO is essential for SMEs seeking to thrive in today's increasingly competitive and uncertain business landscape.

### **Conclusion and Recommendation**

The findings of this study underscore the pivotal role of entrepreneurial orientation (EO) in shaping both learning orientation (LO) and firm performance within small and medium-sized enterprises (SMEs). EO fosters an organizational culture that promotes innovation, risk-taking, and proactivity—factors that collectively contribute to the development of dynamic learning capabilities. Such a culture enables SMEs to remain agile in the face of environmental uncertainties and facilitates the development of strategic competencies that are vital for long-term competitiveness and sustainability.

The study confirms that both EO and LO exert direct positive effects on SME performance, while LO also plays a mediating role, reinforcing the link between EO and performance. These findings highlight the synergistic relationship between entrepreneurial and learning orientations in enhancing firm capabilities, particularly in navigating complex and rapidly changing markets. The integration of EO and LO promotes not only operational efficiency and adaptability but also supports innovation-driven growth and value creation.

From a practical perspective, the results suggest that SME leaders should place strategic emphasis on cultivating entrepreneurial behaviors and a strong learning culture. By doing so, SMEs can improve decision-making quality, foster innovation, and gain a sustainable competitive advantage in both financial and non-financial dimensions. Encouraging employee engagement in learning and experimentation, supporting creativity, and promoting proactive market strategies are essential actions that can significantly enhance organizational resilience and performance.

### **Recommendations for SMES**

SMEs should embrace entrepreneurial orientation by fostering creativity, encouraging proactive operations, and supporting initiatives that drive innovation. Emphasizing EO will enhance organizational learning, leading to innovative thinking and competitiveness.

To improve SME performance, it is essential to cultivate a learning culture within the organization. This includes promoting knowledge-sharing and skill exchanges among employees, organizing team-building activities, fostering a shared vision, and providing training to develop new

knowledge and skills. Such initiatives promote creativity and innovation. Moreover, entrepreneurs should enhance their leadership capabilities through training, while also encouraging EO by supporting new ideas, product development, and exploration of new markets.

The observed relationship between EO and LO—particularly in fostering innovation-driven learning at both the entrepreneurial and employee levels—provides empirical evidence that can be utilized by government agencies and educational institutions. These insights are instrumental in guiding the development of programs that promote entrepreneurship and innovation among SMEs, thereby contributing to sustainable national development.

Entrepreneurs can also use the study's findings to build collaborative relationships and knowledge-sharing networks, especially within the SME manufacturing sector. The results underscore EO as a key driver linking learning orientation to SME performance in this sector.

### Recommendations for next study

Future studies should explore SMEs in the commercial, service, or agricultural sectors to compare and contrast with the current findings. This would provide broader insights applicable across business sectors.

Additionally, since this study focused solely on EO as an independent variable, future research could investigate its relationship with other variable. This would provide SMEs with further valuable information to enhance their business development strategies.

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# The Impact of Logistics Capabilities on 3PL Provider Firm Performance

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## Abstract

This research investigates the impact of logistics capabilities on firm performance in third-party logistics (3PL) providers. Drawing on the resource-based view, the researchers examine how three key capability dimensions—service capability, innovation capability, and flexible capability—influence both service and financial performance outcomes. Using SMART PLS 4.0 with data collected from 205 3PL firms in Thailand, the research reveals that all three capability dimensions significantly enhance service performance, with flexible capability demonstrating the strongest effect. Innovation capability uniquely contributes directly to both service and financial performance, while service and flexible capabilities influence financial outcomes primarily through service performance. The findings validate the service-profit chain framework in logistics contexts and highlight innovation capability as a valuable strategic resource generating dual benefits. This research advances the theoretical understanding of capability-performance linkages in logistics outsourcing while providing practical insights for 3PL providers seeking to prioritize capability investments for competitive advantage. By distinguishing between direct and indirect performance effects across capability dimensions, the study offers a more nuanced perspective on how logistics capabilities translate into measurable performance outcomes in increasingly complex supply chain environments.

**Keywords:** Third-party logistics providers, Logistics capability, Service performance, Financial performance

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## Introduction

Third-party logistics (3PL) providers have experienced growing global demand as more businesses choose to outsource their logistics operations. These specialized partners offer end-to-end logistics solutions that cover the entire supply chain spectrum, including procurement services, warehousing facilities, comprehensive inventory management, packaging operations, materials handling systems, and advanced logistics information technologies (Centobelli, Cerchione, & Esposito, 2017; Jager, Hilletoft, & Ujvari, 2009). Furthermore, 3PL providers have emerged as crucial players in this evolving landscape, offering specialized capabilities that help client firms navigate complex supply chain environments.

The capabilities of 3PL providers—their resources, skills, and competencies—are critical factors determining their performance and competitive position in the marketplace (Hasan, Lei, & Bian, 2024). Based on existing literature, logistics capabilities influence firm performance (Ho & Chang, 2015; Kumar & Prashar, 2024; Lyu, Chen, & Huo, 2019). Despite extensive research on 3PL capabilities and performance, major significant gaps remain. First, most studies focus on specific contexts rather than taking a comprehensive approach that captures potential competence interactions and synergies (Saukko, Aaltonen, & Haapasalo, 2022; Zhang & Okoroafo, 2015), providing an integrated competence assessment framework but acknowledging the need for empirical investigations across diverse 3PL contexts. Second, the relative contribution of different capabilities to service versus financial performance and performance in the setting of 3PL businesses remains unclear (Kumar & Prashar, 2024; Zhou, Wang, Wang, Zhao, & Feng, 2023). Finally, Huang and Huang (2012) state that previous research had proposed that logistics capabilities are complex constructs. Therefore, it should clarify the constructs. Also, Hasan et al. (2024) identify that understanding logistics capability factors is crucial for organizations seeking to attain exceptional operational effectiveness, particularly since the systematic analysis of these factors remains underdeveloped in existing research.

From the above, this research addresses significant gaps in the 3PL literature by implementing a comprehensive capability framework that distinguishes between service and financial performance outcomes. The study captures their strategic perspectives on capability development and performance implications by examining capability interactions and synergies while collecting data directly from 3PL providers. This research investigates explicitly the relative

contribution of different capabilities to service versus financial performance—an underexplored area—while shifting focus from the commonly studied client perspective to the 3PL provider's viewpoint. Through quantitative performance insights, this study contributes to the theoretical understanding of capability-performance linkages in logistics outsourcing. . It also provides practical insights for 3PL providers seeking to enhance their market position through strategic capability development.

Beyond the research gaps mentioned above, this study is particularly significant in the Thai context, which differs considerably from the developed countries where most previous research has been conducted. The structure of third-party logistics (3PL) providers in Thailand has distinct characteristics that differentiate it from developed nations. The Thai 3PL market predominantly consists of small and medium-sized enterprises (SMEs), with over 80% of 3PL providers in Thailand having fewer than 200 employees, in contrast to developed markets, which are typically led by large-scale service providers (Rattanopat, Thitiphanphak, & Pimpanit, 2021). Furthermore, 3PL providers in Thailand face resource constraints and limited capacity for technological and innovation investments, which may affect the development of the three logistics capability dimensions examined in this research. Studying the Thai context fills a gap in the literature by offering perspectives from an emerging market with different economic, social, and cultural contexts from developed countries. This contributes to a more comprehensive and diverse understanding of the relationship between logistics capabilities and performance outcomes across different business environments. Therefore, this study investigates the impacts of three-dimensional logistics capabilities (Service, Innovation, and Flexibility capability) on service and financial performance

## Literature Review

### Resource-Based View (RBV) in Logistics

The resource-based view (RBV) provides a theoretical foundation for understanding how firms' unique resources and capabilities contribute to competitive advantage (Barney, 1991; Wernerfelt, 1984). In the logistics context, RBV has been applied to explain how 3PL providers develop distinctive capabilities that are valuable, rare, inimitable, and non-substitutable (Lai, Li, Wang, & Zhao, 2008; Yeung, Zhou, Yeung, & Cheng, 2012). The creation of capabilities necessary

for effective supply chain management, as well as discussing how these capabilities align with the RBV framework to achieve sustainable competitive advantage (Clifford Defee & Fugate, 2010).

Recent extensions of RBV in logistics research by Yang, Pan, Song, Ma, and Yang (2023) demonstrate that capability configurations, rather than isolated capabilities, determine competitive positioning. Their empirical study showed that complementary capability bundles produced higher performance outcomes than the sum of individual capabilities. Similarly, Wang, Agyemang, and Jia (2021) integrate RBV and resource orchestration theory to analyze how logistics service providers can effectively manage resources to enhance service performance and achieve a competitive edge.

### **Logistics Capabilities of 3PL Providers**

Third-party logistics (3PL) providers offer services that enable businesses to outsource various elements of their supply chain management. These providers typically provide a comprehensive range of services encompassing transportation, warehousing, inventory control, order processing, distribution, returns management, systems integration, and analytics solutions. 3PL providers bring a comprehensive set of logistics capabilities that enable businesses to optimize their supply chains, reduce operational costs, and focus on core competencies (Zhang & Okoroafo, 2015).

Logistics service capability refers to transportation and logistics services that fundamentally depend on this capability to serve customers effectively (Wang, Jie, & Abareshi, 2017). RBV suggests that firms utilize capabilities and resources to establish competitive advantages (Wernerfelt, 1984; Wang et al., 2021; Yusuf, Gunasekaran, Adeleye, & Sivayoganathan, 2004). Capability represents a firm's ability to deploy its resources, both tangible and intangible, to complete tasks or activities that improve organizational performance (Rengkung, 2022). Following Hasan et al. (2024), who identify the logistics capability factors that contribute to firm performance, and Huang and Huang (2012), who explore and develop a measure of logistics capability for LSPs, this research examines logistics capability from an LSP perspective, focusing specifically on service capability, innovation capability, and flexibility capability.

Service capability represents a firm's capacity to respond to and serve its customers effectively. Within LSPs, customer service is an essential business mechanism that facilitates customer communication while delivering value and enhancing response times. This critical role

of customer service as a fundamental logistics capability has been extensively documented in the literature (Hasan et al., 2024; Zhao, 2019).

Innovation capability represents an organization's capacity to convert knowledge and ideas into novel products, processes, and systems that deliver tangible benefits to the firm (Wang, 2016; Yang, 2012). Within the logistics domain, innovation capability has emerged as a fundamental component of effective logistics management (Wang, Asian, Wood, & Wang, 2020).

Flexibility capability represents an organization's capacity to adapt and respond to changing circumstances or unexpected events (Aziz, Razak, Hussin, Yaacob, & Merican, 2017). Flexibility serves as a critical mechanism for managing uncertainty in logistics operations. Volume flexibility allows organizations to accommodate fluctuating demand levels, while operations flexibility enables adaptation to changing process requirements or disruptions (Hasan et al., 2024; Wang, Wood, & Wang, 2022).

### **Performance Outcomes in 3PL Providers**

Logistics providers fulfill an essential function within supply chain systems by facilitating the movement of goods and information between diverse business partners (Wang, Jie, & Abareshi, 2015). Their logistics performance emerges as a critical success determinant for the service providers and their customer organizations (Vlachos & Polichronidou, 2022). In this research, firm outcomes in 3PL Providers include service and financial performance.

Service performance encompasses various dimensions of service quality and customer satisfaction. Reliability, responsiveness, and service recovery are key performance metrics (Hasan et al., 2024). Yang (2012) established empirical linkages between operational capabilities and service performance outcomes. More recently, Wang et al. (2022) expanded service performance measurement to include responsiveness, innovation, and flexibility, reflecting evolving customer expectations.

Financial performance outcomes typically include profitability, revenue growth, and return on investment. Kumar and Prashar (2024) demonstrated empirical relationships between logistics service capability and financial performance. Superior service performance often translates into premium pricing and improved margins, and capability investments may show delayed financial returns, highlighting the importance of assessment approaches (Zhou et al., 2023).

## Hypotheses Development

### Effects of Logistics Capability's Dimension on Firm Performance

Previous research in the logistics domain has established a positive correlation between logistics capability and organizational performance outcomes (Aziz et al., 2017; Ho & Chang, 2015; Lyu et al., 2019; Yang, 2012). For LSPs, these capabilities manifest their impact across operational metrics and financial results (Liu & Lyons, 2011). The multidimensional nature of logistics capability encompasses several critical elements: innovation capacity, service response capabilities, and operational flexibility. Among these, logistics innovation capability serves as a cornerstone in mitigating supply chain uncertainties and risks while simultaneously enhancing overall logistics performance (Wang et al., 2020).

The dimension of logistics capability represents the organization's ability to deliver customer-focused solutions. LSPs with superior service capabilities are better positioned to address diverse customer requirements across logistics services, achieving enhanced service performance outcomes (Hasan et al., 2024). Flexibility is particularly crucial in transportation, enabling organizations to develop alternative options that effectively address capacity constraints and shortages (Pellegrino, Costantino, & Tauro, 2021).

This connection underscores how logistics capabilities are foundational elements that enable rapid adjustments to market changes and disruptions throughout the extended supply network. Consequently, well-developed logistics capabilities represent a pathway through which organizations can achieve distinguished performance outcomes and establish sustainable competitive advantages in their respective markets. Thus, the hypotheses proposed that:

H1a-b: Service Capability is positively related to service (a) and financial (b) performance.

H2a-b: Innovation Capability is positively related to service (a) and financial (b) performance.

H3a-b: Flexible Capability is positively related to service (a) and financial (b) performance.

### Service Performance and Financial Performance

Firm performance is a subset of organizational effectiveness that includes both operational and financial outcomes (Santos & Brito, 2012). The financial dimension manifests

through customer retention rates, sales growth trajectories, profit margin expansion, and enhanced returns on invested capital. Concurrently, market performance is reflected in successful market penetration initiatives and sustained market share growth.

Service performance metrics serve as leading indicators that often precede financial outcomes, providing management with early signals about potential challenges or opportunities in the market (Liu & Lyons, 2011). Such decisions require careful deliberation to prevent financial losses and preserve customer satisfaction levels. The financial impact of service performance intensifies in competitive markets where product differentiation proves challenging. When product features and specifications converge across competitors, service quality emerges as a decisive factor in purchase decisions (Ho & Chang, 2015; Zhou et al., 2023). This phenomenon explains why logistics service providers and manufacturers increasingly emphasize service-level guarantees as core propositions. The hypothesis proposed that:

H4: Service Performance is positively related to Financial Performance.

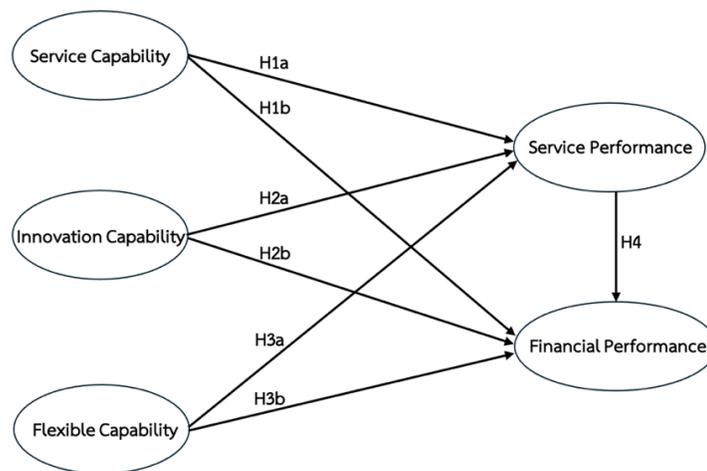


Figure 1 Conceptual Framework

## Research Methodology

### Sample and Data Collection

This research used a quantitative approach. The survey was administered through both digital and paper-based channels. Participants represented various organizational levels, including office executives, supervisors, managers, and senior leadership. To assess potential non-response bias, the researchers contacted a subset of companies that did not initially respond and

compared their demographic characteristics (including company age, firm size, and primary business operations) with those who participated in the study.

This research employed a purposive sampling approach, a non-probabilistic technique appropriate for investigating the relationship between capabilities and firm performance in the 3PL sector. A single response was collected from each participating company to ensure data independence. The researcher compiled a comprehensive list of 3PL businesses to develop the sampling frame by consulting multiple sources, including the Department of Business Development at Thailand's Ministry of Commerce, the freight industry Yellow Pages, and supplementary Google searches to verify contact information. The selection criteria focused on small and medium-sized, domestically-owned 3PL companies operating in Thailand, ensuring the sample represented local industry characteristics rather than multinational operations. After that, the researcher selected 3PL providers based on the following criteria: they were small and medium-sized companies, were not foreign-owned, and were locally established firms. The questionnaire was emailed to 400 different companies across Thailand, with a request to complete it and an explanation of the study project's goal.

Data collection 205 responses from distinct 3PL firms, representing a response rate of 52.5%. Regarding sample size adequacy, this meets established guidelines for PLS-SEM analysis. According to Hair, Hult, Ringle, and Sarstedt (2020), a minimum sample size of 100 to 200 is generally adequate for PLS-SEM, depending on the complexity of the model (e.g., the number of paths pointing at a construct and the expected effect sizes). Therefore, the obtained sample size of 205 responses is sufficient to ensure robust statistical analysis and generalizability within the 3PL sector. The demographic profile of the respondents is shown in Table 1.

**Table 1** Demographic Profile of the Respondents

	Characteristics	Frequency	Percent
Type of Company	Warehousing	66	32.20
	Transportation	87	42.44
	Packaging and Materials handling	34	16.59
	Other	18	8.78
	Total	205	100.00

**Table 1** Demographic Profile of the Respondents (Continued)

	Characteristics	Frequency	Percent
The firm's employee size	Less than 30	37	18.05
	31- 100	108	52.68
	More than 100	60	29.27
	Total	205	100.00
The Period of Operation	Less than three years	64	31.22
	3 to 6 years	88	42.93
	7 to 10 years	32	15.61
	10 years or more	21	10.24
	Total	205	100.00

Table 1 presents the demographic characteristics of the 205 3PL firms participating in the study. The table is organized into three main categories: Type of Company, Firm's Employee Size, and Period of Operation. This demographic distribution demonstrates a diverse sample across different types of 3PL providers, organizational sizes, and operational experience levels, enhancing the findings' representativeness and generalizability.

### Measurement

The measurement of logistics capability dimensions—service capability, innovation capability, and flexible capability—was based on Huang and Huang (2012) and Wang et al. (2022). The dependent variable was the firm performance based on Zhou et al. (2023). All variables were measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The item objective congruence (IOC) index for each question was assessed, with all questions meeting the criterion of an IOC greater than 0.5, indicating good validity (Turner & Carlson, 2003). The reliability of the study instrument was evaluated through a pilot test involving 30 participants from the logistics industry. Internal consistency of the scales was assessed using Cronbach's alpha, with all constructs exceeding the threshold of 0.70, indicating acceptable to high reliability (Nunnally & Bernstein, 1994).

## Research Findings

### Structural Equation Modeling

Based on several methodological considerations, the research utilized PLS-SEM 4.0 rather than traditional covariance-based SEM. PLS-SEM was selected primarily for its suitability for exploratory research contexts, its robust performance with smaller sample sizes, and its ability to handle non-normal data distributions while simultaneously effectively modeling complex multivariate relationships (Duarte & Amaro, 2018). The increasing adoption of PLS-SEM in contemporary research underscores its effectiveness in addressing these analytical challenges.

### Measurement Model

Outer loadings and composite reliability (CR) tests were employed to evaluate item and inter-item consistency reliability. For validity, outer loadings must exceed the established 0.50 threshold. In this research, CR values surpassed the recommended minimum of 0.7, indicating strong relationships between construct indicators and their corresponding latent constructs. Additionally, the average variance extracted (AVE), which quantifies the proportion of variance in indicators explained by the latent construct, exceeded the recommended 0.5 thresholds (Hair, 2020). The analysis results satisfied all these criteria, with outer loadings ranging from 0.738 to 0.974, CR values between 0.876 and 0.945, and AVE values spanning from 0.640 to 0.852. As displayed in Table 2.

**Table 2** Factor Loading, CR, AVE, and Cronbach's Alpha

Dimension	Items	Factor Loading	Cronbach's Alpha	AVE	CR
<b>Logistics Capability</b>					
Service	SC1	On-time delivery of goods	0.858	0.750	0.900
Capability (SC)	SC2	Good protection for goods' safety and risk	0.858		
	SC3	Prompt response to customers' requirements	0.882		
Innovation Capability (IC)	IC1	Exploring the best methods to achieve corporate goals	0.926	0.775	0.912

**Table 2** Factor Loading, CR, AVE, and Cronbach's Alpha (Continued)

Dimension	Items	Factor Loading	Cronbach's Alpha	AVE	CR
Innovation Capability (IC)	IC2 Using new technology and innovation	0.894	0.854	0.775	0.912
(Continued)	IC3 Entering into newer service routes	0.818			
Flexible Capability (FC)	IQ1 Accommodating non-routine requests	0.918	0.912	0.852	0.945
(FC)	FC2 Handling unexpected events	0.974			
	FC3 Constructing flexible operational procedures and systems	0.876			
<b>Firm Performance</b>					
Service Performance (SP)	SP1 The delivery is faster	0.861	0.863	0.710	0.907
	SP2 The delivery is more punctual	0.797			
	SP3 The service is more convenient	0.894			
	SP4 Flexibility in handling customers' specific requirements.	0.814			
Financial Performance (FP)	FP1 Turnover	0.863	0.811	0.640	0.876
	FP2 Market share	0.774			
	FP3 Return on sales	0.819			
	FP4 Return on investment growth	0.738			

The subsequent step involved assessing the discriminant validity of the measures, which evaluates whether each construct is truly distinct from other constructs in the model. Discriminant validity is demonstrated when correlations between the focal measure and measures of different concepts remain sufficiently low. Essentially, discriminant validity confirms that each construct captures unique phenomena rather than merely reflecting aspects already measured by other variables in the framework. Table 3 demonstrates that the square root of each construct's AVE (diagonal values) is greater than its associated correlation coefficient, indicating appropriate

discriminant validity (Fornell & Larcker, 1981). Recent critique of the Fornell and Larcker (1981) criteria shows that The Fornell and Larcker (1981) criteria have been criticized for their ineffectiveness in detecting discriminant validity issues under common research conditions (Henseler, Ringle, & Sarstedt, 2015). As an alternative, Henseler et al. (2015) proposed the heterotrait-monotrait (HTMT) ratio of correlations based on the multitrait-multimethod matrix approach. The model was evaluated using this more robust technique, with results presented in Table 4.

**Table 3** Fornell-Larcker Criterion for Discriminant Validity

Constructs	FC	FP	IC	SC	SP
FC	0.923				
FP	0.689	0.800			
IC	0.797	0.750	0.880		
SC	0.578	0.652	0.693	0.866	
SP	0.795	0.821	0.786	0.666	0.842

The results in Table 3 demonstrate strong discriminant validity across all constructs. For each construct, the square root of the AVE (diagonal values) is higher than its correlation with any other construct in the model. For instance, Flexible Capability (FC) has a square root AVE of 0.923, which exceeds its highest correlation of 0.797 with Innovation Capability (IC). Similarly, Service Performance (SP) has a square root AVE of 0.842, exceeding its highest correlation of 0.821 with Financial Performance (FP). These findings confirm that each construct in the model captures a unique phenomenon that is empirically distinct from other constructs, supporting the discriminant validity of the measurement model.

**Table 4** Heterotrait-Monotrait (HTMT) Ratio Analysis

Constructs	FC	FP	IC	SC	SP
FC					
FP	0.791				
IC	0.895	0.897			
SC	0.658	0.792	0.822		
SP	0.892	0.977	0.902	0.780	

The HTMT results in Table 4 further validate the discriminant validity of the measurement model. All HTMT values are below the conservative threshold of 0.90, with most values well below this cutoff. The highest HTMT value is 0.977 between SP and FP, which is marginally above the threshold but can be considered acceptable given the theoretical relationship between these constructs in the service-profit chain framework. The next highest value is 0.902 between IC and SP at 0.902, which is very close to the threshold. All other HTMT values are comfortably below 0.90, providing additional confidence in the discriminant validity of the constructs. Combined with the Fornell-Larcker results in Table 3, these findings strongly support the discriminant validity of the measurement model, indicating that each construct represents a distinct concept even when using this more rigorous assessment method.

### Structural Model and Hypothesis Testing

To complete the PLS-SEM analysis, the researcher evaluated the structural model using several key metrics: path coefficients (beta values), coefficient of determination (R-square), and effect size (f-square). The significance of the path coefficients was determined through a bootstrapping procedure with 5,000 resamples. Bootstrapping is a non-parametric resampling technique that enables robust estimation of standard errors, confidence intervals, and significance levels without relying on the assumption of normal data distribution. This method is particularly advantageous in PLS-SEM, where the primary focus is prediction rather than model fit. Hair et al. (2020) noted that bootstrapping ensures higher statistical reliability and prediction accuracy, especially when sample sizes reach or exceed 200 participants, by providing stable and empirically derived significance values for the relationships between constructs.

For Hypotheses 1(a), 2(a), and 3(a), the results show that service, innovation, and flexible capability have a significant positive effect on service performance ( $\beta = 0.212$ ,  $p < 0.004$ , supporting H1(a);  $\beta = 0.283$ ,  $p < 0.000$ , supporting H2(a);  $\beta = 0.447$ ,  $p < 0.000$ , supporting H3(a)).

Hypothesis 2(b) argues that innovation capability is positively related to financial performance, and it has a significant effect ( $\beta = 0.234$ ,  $p < 0.007$ , supporting H2(b)). However, service and flexible capabilities do not have a significant effect on financial performance ( $\beta = 0.120$ ,  $p < 0.103$ , not supporting H1(b);  $\beta = -0.027$ ,  $p < 0.782$ , not supporting H3(b)). Finally, service performance significantly affects financial performance ( $\beta = 0.579$ ,  $p < 0.000$ , supporting H4).

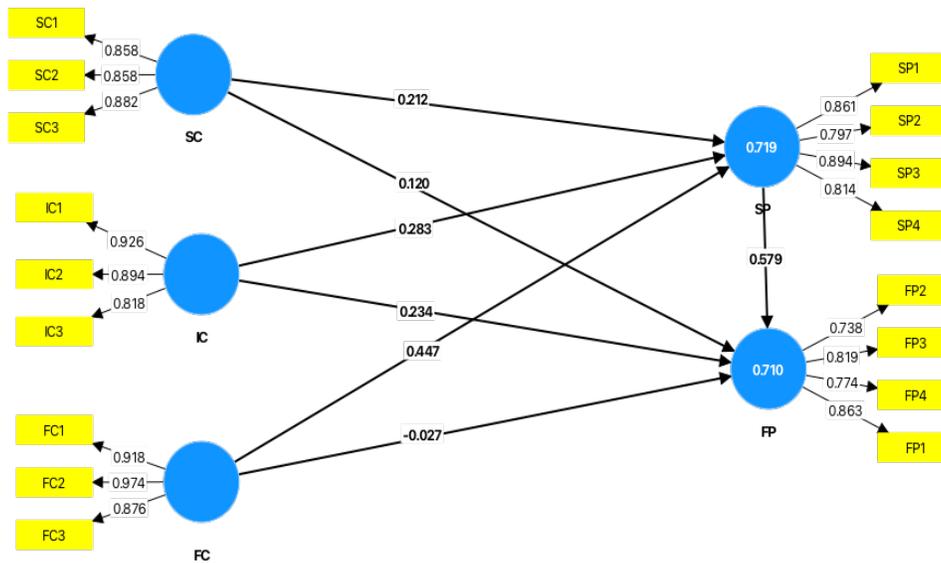


Figure 2 Hypothesis testing

Table 5 Results from Structural Equation Modeling

Relationship Paths	Path	Standard deviation	t- values	p- values	Results	f-square
H1(a): SC -> SP	0.212	0.074	2.858	0.004**	Supported	0.183 (medium)
H1(b): SC -> FP	0.120	0.074	1.629	0.103	Not Supported	0.024 (small)
H2(a): IC -> SP	0.283	0.076	3.723	0.000***	Supported	0.180 (medium)
H2(b): IC -> FP	0.234	0.087	2.676	0.007**	Supported	0.150 (medium)
H3(a): FC -> SP	0.447	0.071	6.336	0.000***	Supported	0.357 (large)
H3(b): FC -> FP	-0.027	0.098	0.277	0.782	Not Supported	0.001 (small)
H4: SP -> FP	0.579	0.092	6.262	0.000***	Supported	0.355 (large)

Note: \*\* is a significant level at 0.01, \*\*\* is a significant level at 0.001.

The results are shown in Table 5 and Figure 2. The coefficient of determination (R-square) was calculated to assess how well the independent variables explain variation in the dependent variables. The R-square values of 0.719 for service performance and 0.710 for financial performance substantially exceed the 0.26 threshold, indicating a robust and meaningful model. While p-values demonstrate the statistical significance of relationships, they do not reveal the magnitude of effects. Therefore, The researcher also reports effect sizes (f-square) to provide a

complete statistical and practical significance assessment. Following Cohen's (2008) guidelines, f-square values of 0.024, 0.150, and 0.35 represent small, medium, and large effect sizes, respectively, providing a benchmark for interpreting the practical significance of the model's relationships. This dual reporting approach addresses potential evaluation challenges by providing both the statistical significance (p-values) and the practical importance (effect sizes) of the relationships identified in the model (Cohen, 2008).

### Research Conclusion and Discussion

The findings directly address the three primary research questions that guided this study. First, regarding which logistics capabilities most strongly influence service performance, the results reveal that all three capability dimensions significantly enhance service performance, with flexible capability demonstrating the strongest effect ( $\beta = 0.447$ ,  $p < 0.000$ ), followed by innovation capability ( $\beta = 0.283$ ,  $p < 0.000$ ), and service capability ( $\beta = 0.212$ ,  $p < 0.004$ ). Second, concerning the direct impact of logistics capabilities on financial performance, The researcher found that only innovation capability directly contributes to financial outcomes ( $\beta = 0.234$ ,  $p < 0.007$ ). In contrast, service and flexible capabilities do not show significant direct effects. Third, regarding the mediation role of service performance, the findings confirm that service performance strongly mediates the relationship between logistics capabilities and financial performance ( $\beta = 0.579$ ,  $p < 0.000$ ), validating the service-profit chain framework in the 3PL context.

The research findings demonstrate the impact of logistics capability on firm performance from a provider perspective. The empirical evidence supports that service capability directly translates into enhanced service performance outcomes. This relationship can be understood through Hasan et al. (2024), who articulate that LSPs with service capability are better positioned to satisfy customers' needs for various logistics services and achieve shorter customer response times and higher customer satisfaction. The empirical findings validate this theoretical position, showing that 3PLs with well-developed service capabilities demonstrate superior service performance. Interestingly, service capability showed no statistically significant direct relationship with financial performance, with a small effect size ( $f^2 = 0.024$ ). This contradicts theoretical expectations but reveals a more nuanced relationship where service capability influences financial outcomes indirectly through service performance as a mediator. This finding aligns with Andria, Hartini, Rahmi, and Rusmanah (2020), who suggest that operational capabilities primarily affect

financial results through intermediate service improvements. For 3PL providers, this indicates that while service capability remains essential, its financial benefits materialize mainly when it successfully enhances service delivery and customer experiences.

Innovation capability significantly enhances both service and financial performance in 3PL providers. It serves as a fundamental driver of service excellence in logistics operations, mitigating supply chain uncertainty and risk (Wang et al., 2020). The findings empirically confirm that 3PL providers with stronger innovation capabilities achieve superior service outcomes. Moreover, innovation capability directly improves financial performance, independent of its effect through service enhancement. This dual impact aligns with Al-Kalouti et al. (2020), who found that innovation positively affects financial and non-financial metrics. Among the three logistics capabilities studied, innovation was the only dimension directly affecting both performance domains.

Notably, innovation capability was the only dimension among the three logistics capabilities studied (service, innovation, and flexibility) that directly affected service and financial performance. This distinguishes innovation as a valuable strategic capability that generates operational excellence and financial returns through multiple pathways. The financial impact operates directly and indirectly through service performance enhancement, creating a dual benefit that maximizes return on innovation investments.

Flexible capability strongly impacts service performance ( $f^2 = 0.357$ ), confirming it as the most influential service determinant. This supports Wang et al.'s (2022) view that flexibility expands delivery options and manages uncertainty. Interestingly, the finding that flexible capability does not directly impact financial performance contradicts Ho and Chang's (2015) study. A study by Rattanopat et al. (2021) found that Thai firms often lack professional services and effective cost management. This likely reflects Thai 3PL providers' unique context, where most SMEs have limited resources. The high costs of maintaining flexibility—including temporary labor, overtime, and adaptable equipment—may offset financial gains in the short term. Additionally, customer price sensitivity in the Thai market limits providers' ability to charge premiums for flexible services. This highlights how capability-performance relationships vary by context and suggests that Western-developed models may need adaptation for emerging markets like Thailand.

This research offers key insights for 3PL providers. First, developing a balanced capability portfolio is essential, with innovation capability deserving of priority investment as it uniquely directly improves service and financial performance. Second, while flexible capability most strongly enhances service performance, it requires complementary capabilities to generate financial returns. Managers should view flexibility investments as enhancing service quality first, with financial benefits following indirectly. Third, the research validates the service-profit chain in logistics, showing that service capabilities primarily affect financial outcomes through service improvements. This highlights the value of tracking service metrics as leading indicators for financial performance.

### Limitations and Future Research

This research has limitations that suggest directions for future research. The cross-sectional design limits causal inferences; longitudinal studies would better track how capabilities affect performance over time (Wallenburg & Weber, 2005). This research focus on Thai 3PL providers restricts generalizability; comparative regional studies would clarify contextual influences on capability-performance relationships (Yang et al., 2023). This research also did not examine contingency factors like environmental dynamism and competitive intensity as potential moderators (Wilhelm, Schlömer, & Maurer, 2015). Future research should investigate these factors to better understand when and how logistics capabilities enhance performance across different operational contexts.

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## Next-Gen AI for Business Transformation

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### Abstract

This academic paper examines the process of transforming business to modern era with artificial intelligence technology. To serve as a guide for digital entrepreneurs in Thailand. Referring to information from global indices and government policies that support the creation of artificial intelligence innovation for the public and private sectors. Business transformation involves many factors, including the integration of advanced technologies into business processes. Adapting new business strategies and models Developing skills in using artificial intelligence for personnel, determining operational measures. Reorganization and culture evolution. The business transition to the artificial intelligence era with agentic AI is an evolution of AI that could understand commands or targets and turn them into a series of complex actions without relying on human control. It is considered a change in AI that supports entrepreneurs in the digital era for competition. The Artificial Intelligence regulatory framework under the EU AI Act and the National AI Action Plan for Thailand's Development establishes guidelines for data management to associate technology, ethics, and good governance, build consumer confidence, and promote social responsibility.

**Keywords:** Business transformation, AI transformation, Agentic AI, AI Governance

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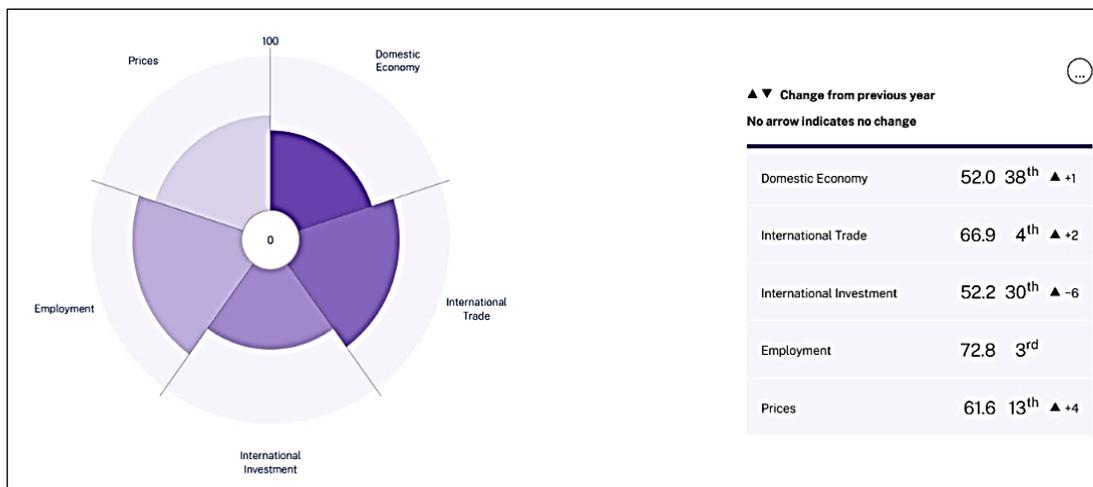
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## Introduction

The Networked Readiness Index (NRI) report, a global digital index survey by the World Economic Forum (WEF), reflects the potential of Thai entrepreneurs to adapt and use technology at a medium level. Thailand is ranks 53<sup>rd</sup> out of 133 countries, while its innovating ranking is 40<sup>th</sup>. These results reflect the ability of Thai business to adapt to the digital age (Portulans Institute, 2024). The continuous promotion of the digital economy in Thailand encompasses various sectors across manufacturing and service industries related to digital technology. These are divided into five components: hardware and smart device, software, communications, digital service, and digital content (Jongwanich, 2024).

According to the 2025 global survey and ranking by the International Institute for Management Development (IMD, 2025), Thailand's competitiveness based on over 330 assessment criteria - demonstrates its structural readiness as a key foundation for the transition to the AI Era. Thai economy is expanding, driven by investment and government policies. Entrepreneurs are responding to these changes by developing necessary infrastructure to increase business efficiency and compete nationally and globally.



**Figure 1** Thailand rankings

Source : IMD (2025) (IMD, 2025)

Figure 1 shows that Thailand's overall economic strength is ranked 38th in the world, 4th in international trade and 4th in international investment. There are still gaps for entrepreneurs in many areas, such as promoting the domestic economy or international investment using artificial intelligence (AI) technology.

Figure 2 show Thailand's strengths in employment and international trade. Entrepreneurs are leveraging these advantages to drive their businesses with AI technology, which is now a key focus and part of the National Economic and Social Development Plan (Digital Thailand Plan). The goal is to enhance business capabilities over a 20-year period, from 2018 to 2037. This is achieved by promoting: 1) AI skills; 2) the creation of workforce assessment tools and support for workforce planning; 3) enhancing the capabilities of Thai workers for the global market; and 4) the application of AI to create an advantage in international trade, based on global market trends and predicting international transportation, export, and logistics costs (Digital Government Development Agency, 2023)

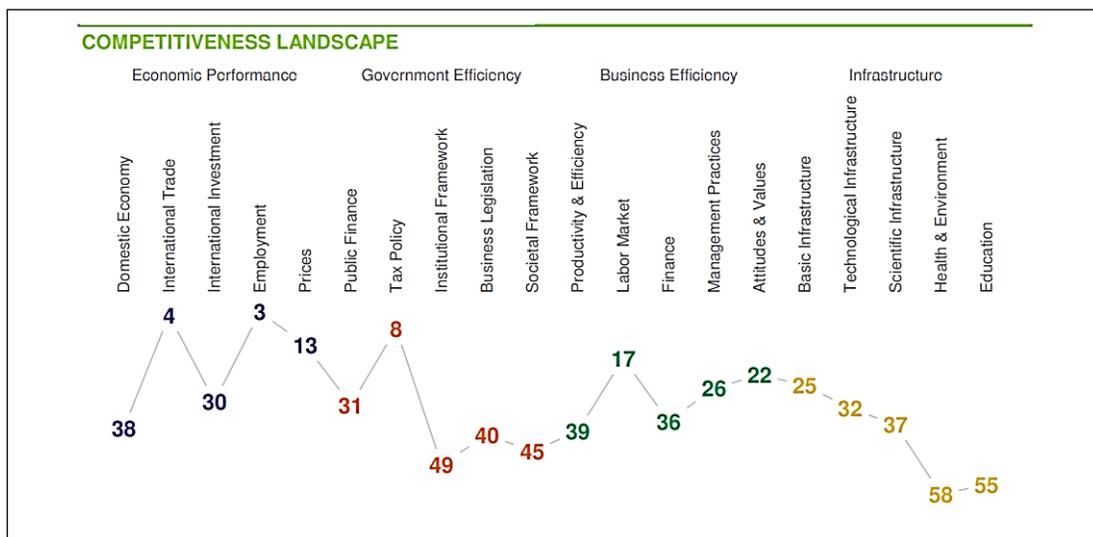


Figure 2 Thailand's competitive landscape

Source: IMD (2025) (IMD, 2025)

The 2024 policy of the Ministry of Digital Economy and Society (MDES) and related agencies aim to increase the digital economy's share through the development of digital infrastructure, fostering a robust ecosystem, and promoting the development of labor skills in key industries and technologies, including semiconductors, electric vehicles (EVs), and artificial intelligence (AI). This policy is also aimed at promoting the adoption of technology in all sectors of business, startups, and emerging technology development (TIDC, 2024).

The transition to a digital economy, coupled with the adoption of artificial intelligence (AI) to promote business development in Thailand, is underway. The government has set a target for

the digital economy to contribute 30% of the country's GDP by 2030, aiming to enhance economic stability and global competitiveness (Reuters, 2024).

This article examines the development of businesses focused on AI-driven businesses, coupled with business processes, in line with the EU's AI Act and the AI Action Plan for Thailand. These approaches are crucial for digital entrepreneurs.

### Business Transformation

By 2025, artificial intelligence (AI) technology will be rapidly transforming the economic structure, labor market, organizational culture, and society, transforming it into a new AI-driven economy, often referred to as the AI Economy. This will impact on the industrial sector as it restructures its operations to align with this technology.

**Table 1** Presents the key factors related to business transformation into the AI Era

Factors related to business transformation	(Sagio et al., 2025)	(Yildiz et al., 2024)	(Shireesha et al., 2024)	(Ávila-Guerrero et al., 2023)	(Bastian Stahl et al., 2023)	(Stukalina & Zervina, 2023)	(Escóbar, 2023)	(Morozova et al., 2023)	frequency
Technology Adoption	•	•	•	•	•	•	•	•	8
Business Model Strategy	•	•	•	•	•	•	•	•	8
Employee & New Skills	•	•	•	•	•	•	•	•	8
Policies & Best Practices	•		•		•		•	•	5
Cybersecurity & Data Privacy	•		•				•	•	4
Organizational Culture		•		•	•			•	4
Organizational Structure				•	•			•	3
Data Management/Analytics	•				•	•			3
Customer Value Creation / Personalization	•			•	•				3
Partnerships/External Expertise		•				•			2
Technology Acceptance	•		•						2

Source: Data collected by the author (2025)

From the synthesis of factors related to business transformation to the AI Era, the following key factors were identified:

1. Advanced technology integration in preparing for technological expansion by establishing a foundation on global digital platform. Creating an ecosystem to support users and integrate digital platforms and tools into work processes. This includes incorporating advanced technologies such as automation, autonomous vehicles, data analytics, cloud computing, artificial intelligence, big data, blockchain, IoT, AR/VR, quantum technology, robotics into business operations and innovation.

2. Business strategies and business models focus on setting strategic goals and technology strategies to drive business growth. Applying technology appropriately to the current era, providing flexibility, helping to increase operational efficiency, increasing opportunities and creating new markets. Such technology makes communication with customers more effective, creating quantitative success indicators using digital indicators instead of traditional KPIs.

3. Reskilling focuses on supporting employee reskilling to understand technology adoption and AI-driven processes.

4. Policies and Practices focus on establishing guidelines under the AI governance framework for business operations to ensure customer confidence in accuracy, transparency, and security of data.

5. Cybersecurity and Data Privacy focus on establishing guidelines for protecting personal data in business processes, risk management, loss prevention, and data security.

6. Organizational Culture focuses on creating an organizational culture that encourages employees to adapt and adapt to changing work methods, including restructuring and reducing staff as needed, and monitoring changes.

In summary, to successfully transform today's business operations, entrepreneurs need to integrate AI technology into their business strategies to add value and create new, personalized customer experiences. This includes investing in employee reskilling, establishing policies and practices, restructuring, and building an organizational culture.

The following guidelines can be summarized as business transformation approaches to the AI era:

1. Current Situation Analysis (AS-IS) is conducted to assess the current situation, analyze the organization's strengths, weaknesses, opportunities, and risks.

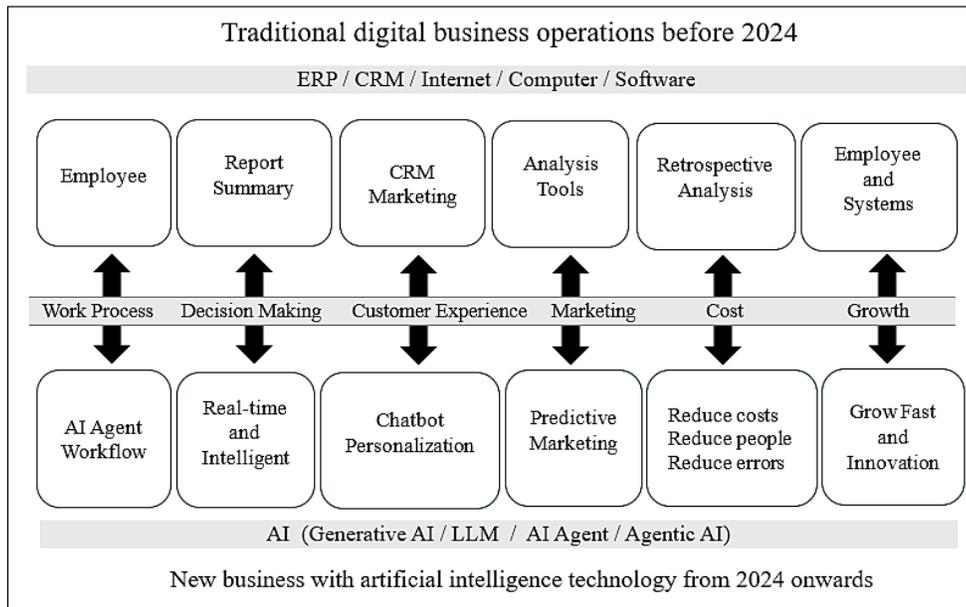
2. New Vision and Strategy involves defining the vision, creating new strategies, and goals to align with the business direction and AI.
3. Organizational Restructuring focuses on changing work styles and prepare necessary resources for new work processes.
4. AI Technology Adoption is conducted to implement AI in business processes and support decision-making.
5. Automation involves improving automated work processes, redundancy, and integration of AI into workflows.
6. Organizational Culture is conducted to create new values and focus on internal communication to understand AI-driven changes.
7. Training focuses on developing AI skills for employees.
8. Monitoring and Evaluation is conducted to monitor and evaluate the progress of the changes.

### **Comparing Business Transformation to the Artificial Intelligence Era.**

Artificial intelligence technology has significantly transformed current business processes. Technology has increased efficiency. Entrepreneurs in the AI era need to restructure their organizations. Automating work processes instead of traditional methods has resulted in employee layoffs and reduced salary costs. AI supports the creation of a new, agile organizational culture, fostering innovation.

Before 2024, entrepreneurs will use digital technology to conduct business, primarily driven by employees. Operational data collection, access, and processing of data will be done on the cloud. Software applications include accounting and finance programs, CRM systems, and online marketing platforms. Related devices include computers, servers, IoT devices, and motion sensors. Supporting technologies include email systems, electronic document management systems, and online marketing tools.

Executive decisions are based on employee reports and knowledge gained from experience. Business costs vary depending on relevant factors, and organizational growth is primarily dependent on the efficiency of employees and infrastructure.



**Figure 3** Compare business transformation to AI technology

Source : Created by the author (2025)

Since 2024, digital entrepreneurs have been implementing AI in business processes to reduce redundant processes and automate them, increase agility, and reduce errors. Work patterns after 2024 are undergoing a transformation, with artificial intelligence replacing humans in many organizational roles. Artificial intelligence relies on analyzing complex, large-scale data and making decisions on behalf of humans. Generative AI is a development in artificial intelligence that efficiently creates content, marketing campaigns, and various forms of digital media, saving time and operating costs. It also helps develop professional marketing strategies and creates personalized customer experience by recommending products of interest, automatically answering questions, and providing after-sales support.

### AI Transformation

The transformation to AI-powered business means fully integrating AI technology into business processes. Organizational restructuring shifts from traditional digital technologies to AI-driven automation. Entrepreneurs are reshaping their business models, rethinking their strategies, and making comprehensive changes to their work processes, decision-making, and organizational culture to align with the times and changing technologies, while also considering energy and the environment (Chen, L, 2023). AI is a technology that reduces operating costs, detects data

anomalies, analyzes financial risks, and improves credit and investment efficiency. This creates new revenue streams, as well as analyzes customer behavior and responds to customer needs (depa, 2024).

The shift to AI is a transition to modern technologies for business processes and delivering new experiences to customers. This transformation includes improving algorithms and working with AI agents, which automate tasks from the beginning to the end (Bai et al., 2025). AI decision-making is dynamic, supports collaborative workflows, increases flexibility and accuracy, and provides real-time feedback to solve complex problems across industries (Singh et al., 2025). Artificial intelligence technologies include large language models (LLMs) that are pre-trained on massive amounts of data and can operate independently (Yuksel & Sawaf, 2024). AI agents automate business processes by learning from data and making decisions to achieve goals without the need for humans (Khanda, 2024).

Artificial intelligence-driven automation supports employee performance, enabling internal process restructuring, improving data utilization, increasing employee efficiency, and creating innovative, personalized customer service offerings, increasing competitiveness across industries (Bulchand-Gidumal et al., 2024). Artificial intelligence drives business innovation and fosters customer engagement (Wang et al., 2023). AI-powered systems reduce processing time, provide 24/7 customer service, and support insights into consumer behavior, enabling businesses to leverage their marketing efforts and create promotions that truly appeal to their target customers (Gao Xueyuan & Feng Hua, 2023).

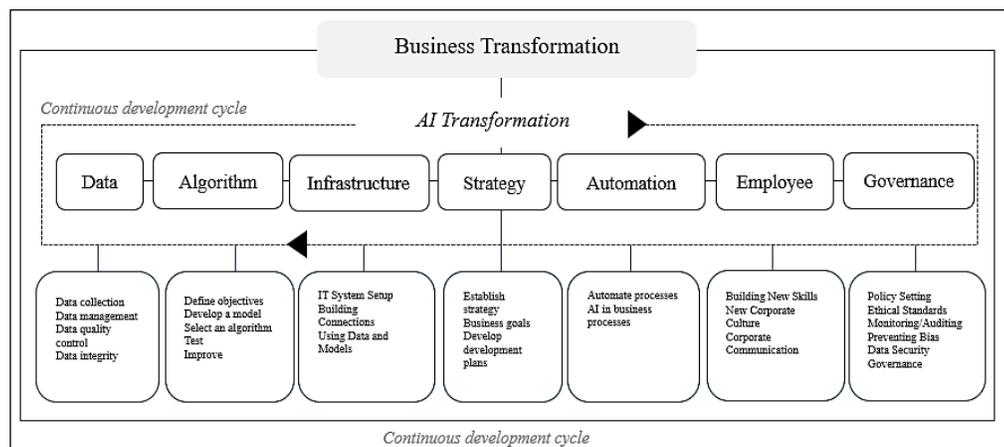


Figure 4 Components of Business Transformation with AI Technology

Source : Created by the author (2025)

The transition to the AI era consists of:

1. Data: This focuses on all data related to business operations, such as customer data, product data, and financial transaction data.
2. Algorithms: These involve step-by-step methods for solving problems and completing tasks. AI learns from the data and generates insights.
3. Infrastructure: This includes technological infrastructure, devices, and systems and databases that support operations.
4. Strategy: This supports business strategies that support new business activities.
5. Automation: This aims to integrate AI to increase efficiency through automated tools.
6. Employees: This focuses on developing new skills to understand the interplay between humans and AI.
7. Governance and Ethics: This establishes responsible and transparent AI governance policies for customers.

From 2025 onwards, amid ongoing technological change, entrepreneurs who can adapt quickly will find new opportunities for their own businesses or new businesses facing unprecedented competition.

### **Agentic AI**

Agentic AI is the next evolution of AI, with capabilities superior to Agent AI. This signals a significant shift for digital entrepreneurs in the AI era (Pipakdee, 2025). Agentic AI further automates business processes, enabling automated decision-making, autonomous operation, rapid response, and proactive work, reducing previous limitations (Mohajan, 2025). Multi-agent collaboration (Sawant, 2025) increases business efficiency and supports personalized customer experiences (Wongcharoensangsi & Athikulrat, 2025). Implementation must be coupled with relevant AI governance frameworks (Hosseini & Seilani, 2025) and accountable (Dechachai et al., 2025; Murugesan, 2025).

Agent AI impacts various industries. The lifecycle of agentic AI in business processes involves the management of data via AI by each department within an organization. These include:

1. Users, meaning customers, employees, or those interested in a product. By requesting information by submitting a query to the relevant system.

2. System refers to an agentic artificial intelligence developed for use in business activities, adhering to AI ethics regulations.

3. Agentic Operating System refers to a data management system consisting of an Orchestration Layer that coordinates communication with the core and formats the results. The Integration Layer connects data from various systems, including ERP, CRM, and MDM, to facilitate AI operations.

Internal communication within Agentic AI is categorized as follows:

1. Agent-to-Agent Communication
2. Agent-to-Human Communication
3. Agent-to-Agent Communication, which still requires human participation for verification.

The Data Management Agentic Marketplace is a data management platform for Agentic AI, consisting of 1. Data Discovery Agent, 2. Data Processing Agent, 3. Data Modeling Agent Insights, 4. Data & Metadata Generation Agent, 5. Quality Agent, and 6. Data Observability Agent. Digital entrepreneurs in the AI era must be aware of standard practices, integration, and data management to ensure the security of the data generated by AI-driven systems.

### **Explain the overall workflow**

1. The user enters a login query.
2. The system performs Integration Layer checks.
3. The Orchestration Engine breaks down tasks into smaller tasks and assigns them to agents or humans as appropriate.
4. The Agentic Marketplace performs data exploration, processing, modeling, and quality control.
5. The results are refined and validated before being displayed.

This framework enables organizations to efficiently manage data and AI systems, integrate automated and human-generated data, and ensure comprehensive ethical auditing of results.

### **Agentic AI's Five Key Steps:**

1. Goal focuses on achieving a goal or mission.
2. Plan aims to create a plan by integrating relevant data.
3. Execute involves acting in conjunction with systems or data sources.

4. Reflect focuses on evaluating and refining outcomes using memory or previous experience.

5. Respond involves presenting a response or outcome.

Agentic AI is highly effective because it can automatically think, plan, act, and refine outcomes, closely mirroring human cognitive processes.

### **The Benefits of Agent-Based Artificial Intelligence for Business in the AI Era**

1. Automation: Artificial intelligence focuses on improving efficiency in automation, saving time and resources.

2. Insights-Driven: Artificial intelligence analyzes big data and applies it to business processes, such as information on products customers are interested in or products that correlate with higher sales, including seasonal promotional events.

3. Customer Experiences: AI creates personalized experiences through communication channels such as chatbots and virtual assistants, providing 24/7 customer support.

4. Predictive Analytics and Forecasting: AI aids in predicting market trends, accurately analyzing customer needs based on historical data.

5. Competition and Innovation: AI supports new business strategies, reduces operating costs, and creates innovative products or services that differentiate them.

6. Personalized Marketing: AI supports marketing campaigns by providing accurate data forecasts and recommending products and services that truly meet customer needs.

7. Fulfillment Center: Artificial intelligence automatically manages inventory and monitors out-of-stock items. The system notifies employees and analyzes sales, new products to order, unsold items, and customer purchasing behavior.

### **AI Governance Framework**

The EU AI Act is the first global AI regulation, enacted by the European Union. It provides guidelines for the regulation of AI in organizations, addressing fundamental rights and the safety of AI-powered systems. These include: 1) transparency, 2) accountability, 3) fairness, and 4) governance. To prevent the misuse of AI, the Act protects citizens' fundamental rights, promotes responsible innovation, builds trust in technology, and prepares organizations for global competition (European Commission, 2025).

### AI is categorized into four levels of risk.

1. Unacceptable Risk - AI systems that pose a significant risk to humans are considered dangerous and should never be used. Examples include AI systems related to cognitive manipulation, social scoring based on personal data, facial recognition in public spaces, biometric classification of individuals, and discrimination based on biometric data.

All AI systems deemed to pose a clear threat to the safety, livelihood, and rights of citizens are banned. The AI Act prohibits the following.

1. Malicious manipulation and deception using AI
2. Malicious exploitation of vulnerabilities using AI
3. Social scoring
4. Assessment or prediction of individual crime risk
5. Unspecified collection of internet or CCTV data to build or expand facial recognition databases
6. Emotion recognition in workplaces and educational institutions
7. Biometric classification to identify protected characteristics
8. Real-time remote biometric identification for law enforcement purposes in public accessible spaces

2. High Risk - AI systems that pose risk to human health, safety, or fundamental rights, such as AI use in facial recognition, education, or employment. Developers must adhere to strict regulations.

High-risk AI systems must comply with strict requirements before they can be deployed or placed on the market.

1. Appropriate risk assessment and mitigation mechanisms
2. High-quality data fed into the system to minimize the risk of discrimination outcomes
3. Activity logging to ensure traceability of system outcomes
4. Comprehensive documentation providing all necessary information about system and its objectives for regulatory assessment
5. Clear and sufficient instruction for deployers and users
6. Co-human Governance

## 7. Cybersecurity

3. Limited Risk - AI systems that require transparency and inform users about their AI processing, such as chatbots or video analytics tools.

This refers to AI systems that have limited risk but require transparency about their use. The AI Act imposes specific disclosure obligations to ensure that humans are adequately informed when interacting with AI. Thereby maintaining trust. For example, when using AI systems such as chatbots, users should be aware that they are interacting with machines so they can make informed decisions. Additionally, providers of creative AI must ensure that AI-generated content is clearly identifiable. Certain AI-generated content, such as deepfakes or messages intended to inform the published on public interest, should be clearly and visibly labeled.

4. Minimal Risk - AI systems that should be used with transparency and safety, such as AI in video games, spam filters, and generative AI.

The AI Act does not regulate AI that poses minimal or no risk. Most AI systems currently in use in the EU fall into this category, including applications such as AI-powered video games or spam filters. Once an AI system is deployed, relevant authorities are responsible for market surveillance. The system implementers are monitored and controlled by humans, and the service provider maintains a post-launch monitoring system. Both the service provider and the system implementer are also required to report any serious incidents or malfunctions.

### **The National AI Guidelines for Thailand's Development, 6-Year Plan (2022-2027)**

Aims to develop AI personnel, develop AI innovations and prototypes that can be applied practically, increase GDP from AI, and increase the use of AI innovations by both public and private sectors.

Summary of key points (National Science and Technology Development Agency, 2022)

1. Prepare society, ethics, laws, and regulations regarding AI, and raise awareness and ethics of AI in society.

2. Develop AI infrastructure and support systems, establish a central data platform and research and development network, invest in digital infrastructure and advanced processing systems.

3. Enhance the potential of AI personnel and education, promote the production and development of AI personnel, promote curriculum development, and create AI-based teaching materials.

4. Develop AI technology and innovation, promote research and prototype development, and lead to practical application. Promote the use of AI in new prototypes and products.

5. Apply AI in the public and private sectors, creating an ecosystem for comprehensive AI adoption in services and education.

### **Thailand's development plan provides AI-era entrepreneurs with the following**

1. Networking with AI-skilled personnel, such as engineers, analysts, and AI creatives. They can utilize a centralized data platform and AI research tools provided by the government and its networks, reducing costs, risks, and development time.

2. Entrepreneurs can utilize AI prototypes and innovations for practical use, increasing competitiveness, improving product and service quality, and opening new markets.

3. Businesses can quickly apply AI to manufacturing processes, communications, customer analysis, and after-sales services.

4. Efficient AI development and deployment options are available, combined with cloud computing, advanced processing systems, and interfaces developed by the government.

5. Support from government policies and promotional measures, including new legal, ethical, and regulatory measures, fostering confidence, legality, and social responsibility.

6. Opportunities to become partners in large-scale government projects.

7. Apply AI in education and services to expand the customer base for the education and services sector.

As described by Phuyung Meesaj (AI literacy and the application of the Artificial Intelligence Act in the Digital Era under the Project Ethics, Volunteer Spirit, and Organizational Mindfulness, 21 August 2025), promoting and supporting responsible AI innovation demonstrates the integration of innovation with digital economy policy. (Meesaj, 2025)

Specific laws governing AI include the Cybersecurity Act, the Personal Data Protection Act (PDPA), and the Aircraft Act. These laws cover four main aspects:

1. Artificial intelligence innovations - AI software or hardware that are significantly newly discovered or developed.

2. AI entrepreneurs - entities that sell or provide AI services, including researchers, universities, startups, independent developers, open-source, free service providers, or for the public good.

3. AI innovation testing centers – established as central mechanisms for testing and evaluating AI before entering the market.

4. Data exchanging and sharing – promoting information exchange among individuals, agencies, or the data ecosystem without monopolizing the market.

## Conclusion

This study business development guidelines in the era of artificial intelligence by presenting guidelines for the application of artificial intelligence in the retail business in Thailand, where entrepreneurs use AI systems to analyze customer purchasing behavior. According to the report of the Digital Economy Promotion Agency (depa, 2024) states that department stores and large retailers are already applying AI to customer data management, sales forecasting, and personalized promotions. By adopting the AI Governance Framework, which aligns with the EU AI Act (Nemko Digital, 2025), as a guideline for transparent customer data governance and algorithmic modeling, trust can be maintained and personal data risks effectively mitigated. In the financial sector, AI systems are being used to enhance security and improve service efficiency, such as in areas like credit scoring and fraud detection, and are among the High-Risk AI Systems defined by the EU AI Act. According to the Bank of Thailand (BOT, 2024), large financial institutions in the country have developed machine learning models to analyze the probability of default and are using AI chatbots to provide financial advice to customers. Development must be under Limited-Risk AI criteria, with a data disclosure process and oversight framework aligned with the AI regulatory framework for using AI-powered systems to detect machine malfunctions and analyze potential downtime in advance.

This reduces maintenance costs by more than 25% per year. Furthermore, major logistics companies such as SCG Logistics and Flash Express have developed AI-powered routing systems to optimize delivery routes. This aligns with Thailand's National AI Action Plan (2022-2027), which aims to promote the use of AI to increase productivity and drive innovation.

The study found that business practices for managing organizational change in the AI era are becoming a key factor in determining Thailand's future competitiveness, as indicated in

reports from the WEF and IMD. Given that Thailand is moderately prepared to adapt to the digital economy, it is necessary to accelerate the development of policies and governance frameworks (AI Governance Framework) to build trust, oversight, and ethical use of technology among Thai enterprises. The EU AI Act, which serves as a model for ethical, safety, and transparency standards in AI systems, classifies AI into four risk levels: Unacceptable Risk, High Risk, Limited Risk, and Minimal Risk. These classifications provide guidance for government and private sectors to adopt AI responsibly.

### **Policy proposals for business transformation in the AI era:**

1. Establish an agency to regulate AI for digital entrepreneurs to establish a framework, standards, and ethics for AI to build confidence among consumers both domestically and internationally.
2. Provide tax incentives and investment support for agencies developing AI research and innovation.
3. Promote the use of agent-based AI in the business sector to enhance competitiveness.
4. Develop a human resource development plan to produce AI-savvy personnel to meet future labor market demands.

Considerations for increasing efficiency using AI as a tool for modern entrepreneurs should consider the potential for increased efficiency and consumer benefits, while considering potential risks.

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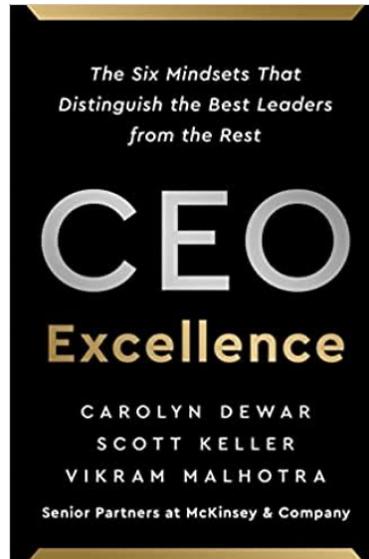
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## Book Review



### CEO Excellence: The Six Mindsets that Distinguish the Best Leaders from the Rest

Authored by Carolyn Dewar, Scott Keller and Vikram Malhotra

Published: 2022 Length: 370 pages

Review by

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The book "CEO Excellence: The Six Mindsets that Distinguish the Best Leaders from the Rest" is authored by Carolyn Dewar, Scott Keller, and Vikram Malhotra from the global management consulting firm, McKinsey & Company. This publication serves as a comprehensive resource of 21st-century leadership wisdom, analyzing the management approaches of top-tier

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Chief Executive Officers (CEOs). The research involved screening over 2,400 CEOs from various public companies, resulting in a selection of 67 high-level executives for in-depth interviews. The list features high-profile executives like Satya Nadella from Microsoft, Reed Hastings from Netflix, and Jamie Dimon from JPMorgan Chase & Co.

The value of this book lies in its ability to distill insights from the mindsets of top leaders. These mindsets are the key factors that enable them to generate sustainable returns and outperform competitors in today's highly volatile business world. The core content identifies six mindsets that align with the primary responsibilities of modern CEOs. Each of these mindsets is more than just a "to-do list"; they represent a way of thinking that helps CEOs approach and resolve complex challenges effectively.

**Mindset 1: Set the Direction** Top CEOs share a fundamental belief that they are the masters of their company's destiny. They refuse to be passive, letting external forces dictate their future. Instead, they demonstrate courage through firm and rapid decision-making to build a sustainable competitive advantage. At its heart, setting the direction is not just about survival; it is about taking control of your own path. This process begins with a "game-changing" vision, one that reframes the game by challenging old assumptions and redefining the market. Instead of simply striving to be number one in an existing market, top CEOs redefine what winning actually looks like. A strong vision should seamlessly align core expertise with market needs to generate revenue, while also looking beyond mere profit margins. It focuses on a larger purpose, such as improving social well-being or creating inspiration, which helps engage and motivate senior leaders.

Furthermore, the focus must be on making "Big Moves" early on. Rather than settling for incremental improvements, CEOs should prioritize major strategic shifts, such as M&A (mergers and acquisitions), capital investment, efficiency gains, differentiation, and resource allocation. Top CEOs must be visionaries who can sense future trends even when others see only the stillness of the present. This requires effective risk management, an entrepreneurial mindset focused on long-term sustainability, and the ability to keep the organization agile and alert. Ultimately, resource allocation requires the courage to "Act Like an Outsider." This means looking past historical

budgets and evaluating value from a fresh perspective. CEOs must prioritize the big picture, moving resources to where they create the most value for the company. They should approve budgets based on milestones rather than the calendar year, and most importantly, have the courage to shut down underperforming projects or business units to make room for new initiatives. Together, these elements form an exceptional strategic direction that propels an organization far ahead of the competition.

### **Mindset 2: Engage the Board**

Top CEOs view the Board of Directors as a vital strategic asset and strive to unlock their full potential to create value for the company. This begins by collaborating with the Board Chair to recruit individuals with the right skills and mindset for the future. Meeting agendas must be shifted to focus on strategic debates and long-term risks rather than simply reviewing past performance. Furthermore, exceptional CEOs build "radical trust" by maintaining transparency, sharing difficult news early and giving the Board visibility into the management team's capabilities. This empowers the Board to move beyond fiduciary oversight and fully serve as effective strategic advisors.

### **Mindset 3: Connect with Stakeholders**

The very best CEOs always start by asking "Why?". They hold a deep conviction that building long-term value is impossible without a purpose that transcends the company itself. For these leaders, contributing to society isn't just about charity work or checking a box for corporate social responsibility. Instead, they weave a clear social mission into the very core of their business strategy, using it to spark innovation and set themselves apart from the competition. When it comes to managing relationships, these executives see themselves as the vital link connecting their internal organization with the outside world. While they are disciplined about spending roughly a third of their time on external matters, they value the depth of those interactions far more than the duration. Their goal is to truly understand what drives their stakeholders, whether it is investors, government officials, or local communities, by grasping the root cause of their

needs. This approach fosters genuine understanding and reduces friction. Moreover, they build lasting credibility by sharing a single, consistent narrative with everyone, maintaining total transparency whether the news is good or bad.

#### **Mindset 4: Manage Personal Effectiveness**

Top CEOs treat their time and energy as their most precious resources. They practice rigorous prioritization, focusing strictly on tasks that only the CEO can do, while effectively delegating the rest. Rather than running a continuous marathon that leads to burnout, they manage their energy in a series of intense "sprints" followed by disciplined recovery periods. They also master the art of "compartmentalization," allowing them to leave work stress behind and remain fully present in the moment, whether tackling a strategic crisis or spending time with family. Ultimately, they focus not just on a "to-do" list, but on a "to-be" list, consciously choosing how they show up and interact with others to maintain their authentic leadership impact.

#### **Mindset 5: Mobilize through Leaders**

Top CEOs deeply understand that the effectiveness of a senior leadership team is measured by how well they collaborate, not just by their individual performance. These exceptional leaders prioritize team dynamics by establishing "First Team Norms", ground rules that clarify decision-making and foster constructive debate without damaging relationships. They also carefully curate a team ecosystem with the right mix of skills and mindsets to support the company's strategy.

#### **Mindset 6: Align the Organization**

Exceptional CEOs treat organizational culture as a critical priority, using it as a powerful engine to drive performance. They manage culture with the same rigor and discipline as they apply to financial matters. This begins by identifying and instilling "The One Thing", a core behavior that truly moves the needle, and ensuring it becomes a reality. At the same time, they design an agile organizational structure with clear accountability and focus on developing talent in high-value roles to maximize their contribution to the organization.

In summary, CEO Excellence offers more than just inspiration; it serves as a practical toolkit and a proven roadmap derived from truly successful leaders. For leaders seeking to elevate their organization's performance to the next level, this book is a treasure trove of wisdom. It empowers you to apply the mindsets and practices of top CEOs to achieve great and sustainable success.

## Reference

Dewar, C., Keller, S., & Malhotra, V. (2022). *CEO excellence: The six mindsets that distinguish the best leaders from the rest*. Scribner.

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#### Formatting Guidelines for Manuscript Preparation

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Manuscripts must be printed on A4-sized paper, single-sided, using single line spacing. Page margins must be set to 2.54 centimeters on all four sides: top, bottom, left, and right. The total length of the manuscript should be between 12 and 20 pages. Page numbers must appear on all pages, centered at the bottom of the A4 sheet, using the **TH Sarabun PSK** font in **16 point** size.

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Author's Name	16	Center (CT)	Regular
Author's Affiliation and Email (Footnote)	14	Center (CT)	Regular
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Abstract Content	16	Left & Right Justified (LRJ)	Regular
Keywords	16	Left	Regular
Main Title	16	Center (CT)	Bold
Subheading	16	Left	Bold
Main Text	16	Left & Right Justified (LRJ)	Regular
Heading for Original Documents	16	Center (CT)	Bold
Content of Original Documents	16	Left & Right Justified (LRJ)	Regular
Table Title (located above the table)	16	Center (CT)	Bold
Table Content	16	Left	Regular
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