

Causal Relationships that Influence the Success of Electronic Commerce Businesses in the Era of Digital Transformation

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Abstract

The Research on causal relationships that influence the success of electronic commerce businesses in the era of digital transformation. The research objectives are 1. To study and analyze the causal relationships that influence the success of electronic commerce businesses in the era of digital transformation. 2 . To create a structural equation model of the success of electronic commerce businesses in the era of digital transformation. The data was collected from a sample of 400 entrepreneurs in the electronic commerce business group who passed the business quality standards and still operate throughout the region. The measurement instrument is a 5 -level estimation questionnaire. The data were analyzed with structural equation modeling (SEM). The research used a blended, quantitative, and qualitative method.

The results showed that, firstly, quantitative research According to the study, 1) factors influencing the success of electronic commerce businesses in the era of digital transformation, it was found that there are 6 factors: quality of website services, service quality, shipping, technology factors, customer satisfaction, the success of electronic commerce, 2) the model of the success of electronic commerce businesses in the digital transformation era developed by the researcher is consistent with the empirical data according to the specified criteria, with values $\chi^2/df = 1.867$, P-Vales = 0.537, CFI = 0.931, GFI = 0.907, RMSEA = 0.042, and RMR = 0.021, which meet the specified criteria. Secondly, qualitative studies show that in the business of electronic commerce, all factors studied are very important in the operation of electronic commerce businesses. This makes customers extremely satisfied.

Keywords: business success; electronic commerce; digital transformation

Introduction

Currently, information technology is constantly advancing. Especially in the field of communication and access to information via the Internet, it has become a great interest for consumers. The use of information technology is part of people's daily lives due to the convenience and speed of data transmission. Research, communication, and online business can be done 24 hours a day without the need for a physical store. The use of information technology reduces the cost of entrepreneurs and consumers in terms of traveling to shop at various stores, which has resulted in a significant growth of online business and can be called electronic commerce. The study of consumer behavior. This includes shipping management (Ministry of Commerce, 2016).

According to a survey on the value of electronic commerce in Thailand between 2017 and 2021 by the Electronic Transactions Development Agency (ETDA), or ETDA under the Ministry of Digital Economy and Society. It was found that in 2020, the value of electronic commerce decreased to 3.78 trillion baht from 4.05 trillion baht in 2019. The decrease was 6.68 percent due to the COVID-19 pandemic, which negatively impacted many industrial sectors. However, the retail and wholesale trade industry continues to grow due to the changing behavior of consumers, who tend to buy goods and services online. The forecast for 2021 indicates that the value of electronic commerce will continue to grow after recovering from the COVID-19 pandemic. According to ETDA's survey results at the "Thailand Electronic Commerce Hackathon 2020", Suttawet Chatthai, Deputy Director of ETDA, stated that one of ETDA's key roles in the past nine years has been to promote, support, and develop online transactions.

From the researcher's past studies, it was also found that the researcher had previously found that the current research lacked exploration in the past and also found that there was a lack of research issues in other dimensions, i.e. a lack of causal factors, other dimensions, namely technological factors that are directly used to make the business successful. Lack of quality website services that can satisfy customers and lead to business success. Therefore, the researcher is interested in studying the causal relationship that influences the success of electronic commerce businesses in the digital transformation era. In the age of digital transformation, how does the electronic commerce business approach ensure continued success?

Objective

1. To study and analyze the causal relationships that influence the success of electronic commerce businesses in the era of digital transformation
2. To create a structural equation model of the success of electronic commerce businesses in the era of digital transformation.

Literature Review

From the literature review, the researcher has studied concepts, theories, and related research results for analysis, synthesis, and composition. They are presented in the following order:

Theory of Electronic Commerce

Dirgantari et al. (2018) Electronic commerce refers to the process of conducting transactions through electronic media via various channels, utilizing the internet and computer networks as intermediaries for communication, exchange of goods and services, or any other transactions between buyers and sellers. This enables users from anywhere in the world to access stores easily and 24 hours a day. The objective is to reduce costs within organizations and enhance efficiency. Electronic commerce is considered a part of online transactions, encompassing any activities conducted electronically between individuals, businesses, private organizations, or governmental entities for business purposes or trade, utilizing electronic means either wholly or partially.

Website service quality

According to Ghaffari et al. (2015), website service quality refers to conducting transactions electronically through various channels, utilizing the Internet along with computer networks as intermediaries for communication, exchange of goods and services, or any other transactions between buyers and sellers. This enables users from anywhere in the world to access stores easily and 24 hours a day. The objective is to reduce costs within organizations and enhance efficiency. E-commerce is considered a part of online transactions, encompassing any activities conducted electronically between individuals, businesses, private organizations, or governmental entities for business purposes or trade, utilizing electronic means either wholly or partially.

Service Quality

Dhingra et al. (2020) refer to Parasuraman et al. (1988). Service quality refers to the key component that influences customers' expectations when purchasing products or services. The quality of service will subsequently affect customer satisfaction. If customers receive good service, they are likely to be highly satisfied and return for repeat business. However, if they receive poor service, they may not return for further transactions. Continuous improvement in service provision by an organization can enhance its efficiency and competitiveness against other organizations.

Shipping

Vasić et al. (2019) mention that 'Shipping' is the movement of people or goods from one place to another using vehicles for transportation, to deliver them to the intended destination. The importance of transportation lies in the aspects of time and the completeness of the transported goods. If goods can be transported to the recipient quickly, the recipient or customer will be highly satisfied. Moreover, if the received goods are in good condition, it further enhances customer satisfaction. This effectively meets the needs of customers.

Customer E-commerce Satisfaction

Luczak et al. (2020) refer to Hansemark et al. (2004) who say that 'Customer E-commerce Satisfaction' refers to the overall attitude resulting from the purchase of products or services, focusing on the disparity between what customers perceive and what they expect after deciding to purchase. If what customers receive meets or exceeds their expectations, it leads to satisfaction and continuous repeat purchases, as well as potential word-of-mouth referrals, ultimately contributing to profit and achieving the organization's goals. However, if what customers receive does not meet their expectations, it may result in negative perceptions and lead them to seek alternative products or services.

Technology Factor

Anaam et al. (2020) Technology Factor refers to is an important component in running any business. In operations, systems must be used, including modern tools, to make operations in the organization efficient. Technology is therefore very important in trading systems, transportation, finance, and data collection. Including every process that must be accurate. Very accurate and safe Because every process affects business efficiency as well as customer satisfaction.

E-Commerce Success

Laakkonen (2018) E-Commerce Success refers to the goals that organizations set when conducting business. It is measured by several factors, such as the website's ability to generate

positive long-term revenue, returns, profits, and customer satisfaction. customer loyalty, including continuous support of products or services, to be able to stay ahead of competitors. As a result, the organization's operations will be efficient and lead to the goals set.

The literature review delves into key aspects of electronic commerce (e-commerce) and its success factors. It emphasizes conducting transactions electronically via the Internet and computer networks to reduce costs and enhance efficiency. Service quality, including website service quality, plays a pivotal role in influencing customer satisfaction and repeat business. Shipping, as the movement of goods, is crucial for meeting customer needs and enhancing satisfaction. Customer e-commerce satisfaction hinges on meeting or exceeding customer expectations, which drives repeat purchases and positive word-of-mouth referrals. Additionally, the technology factor underscores the importance of modern tools for efficient operations and customer satisfaction. Ultimately, e-commerce success is measured by various factors, including revenue generation, customer loyalty, and continuous support, leading to organizational efficiency and goal achievement.

Conceptual Framework

A research study on causal relationships that influence the success of electronic commerce businesses in the era of digital transformation and from a review of the literature regarding all variables. The researcher has developed a model that involves structural equation modeling of variables that affect causal relationships that influence the success of electronic commerce businesses in the digital transformation era. The model consists of six latent variables:

- (1) Website service quality includes 24-hour availability, Up-to-dateness, and Timeliness.
- (2) Service quality includes Quick service, Reliability, and Responsiveness.
- (3) Shipping has Free shipping, Product delivery, and Quality of product delivery at weekends.
- (4) Technology factors have Security issues, IT specialists, and E-commerce processes.
- (5) Customer e-commerce satisfaction includes customers, Trust the Security of personal information and Ease of access to information
- (6) E-Commerce Success have Profit Customer Loyalty Global Reach

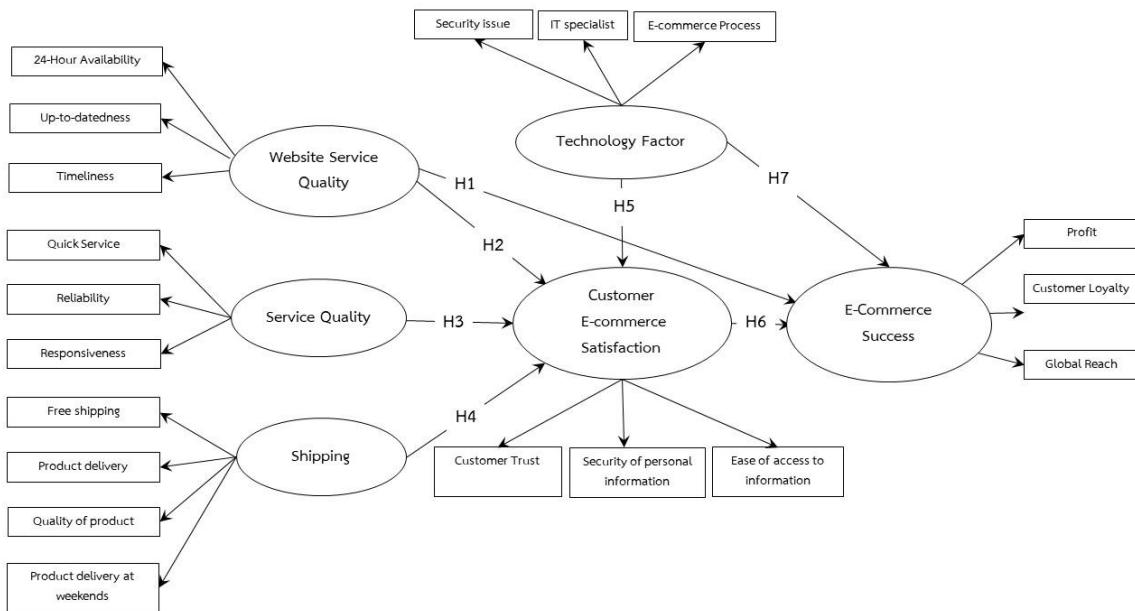


Figure 1 Conceptual Framework

Materials and Methods

This research has variables used in the research:

1. Independent variables include Website Service Quality, Service Quality, Shipping, and Technology Factors.
2. Dependent Variable: Customer E-commerce Satisfaction.
3. Outcome Variable: E-Commerce Success.

Business Content Scope: This research utilizes content related to causal relationships that influence the success of electronic commerce businesses in the era of digital transformation.

Geographic Scope: This research will be conducted within the Bangkok metropolitan area.

Methodological Approach: The research will employ a mixed-method approach, integrating quantitative and qualitative methods.

Timeline: The project will be carried out from December 2021 to December 2024.

Quantitative Approach

Quantitative sample groups include electronic business operators who meet the quality standards, sourced from the Department of Business Development, Ministry of Commerce, in 2022. There were a total of 8 groups of business types, comprising 80,871 companies. The researchers selected a sample size of 400 companies for data collection, calculated based on proportions from each business type. To ensure sample appropriateness for data analysis using the

AMOS program, a Structural Equation Model (SEM) analysis technique was employed. The researchers determined the sample size according to the guidelines of Hair et al. (2014), recommending a suitable sample size of 300 – 400, and a sample size of 10 – 20 times the number of observable variables in the research. In this study, there were 19 observable variables; thus, the appropriate sample size should be at least 20 times 19, which equals 380. Therefore, the researchers increased the sample group to 400 for SEM analysis. The data collection tool used was a semi-structured questionnaire designed to gather information from limited companies, sourced from the Department of Business Development database in 2022.

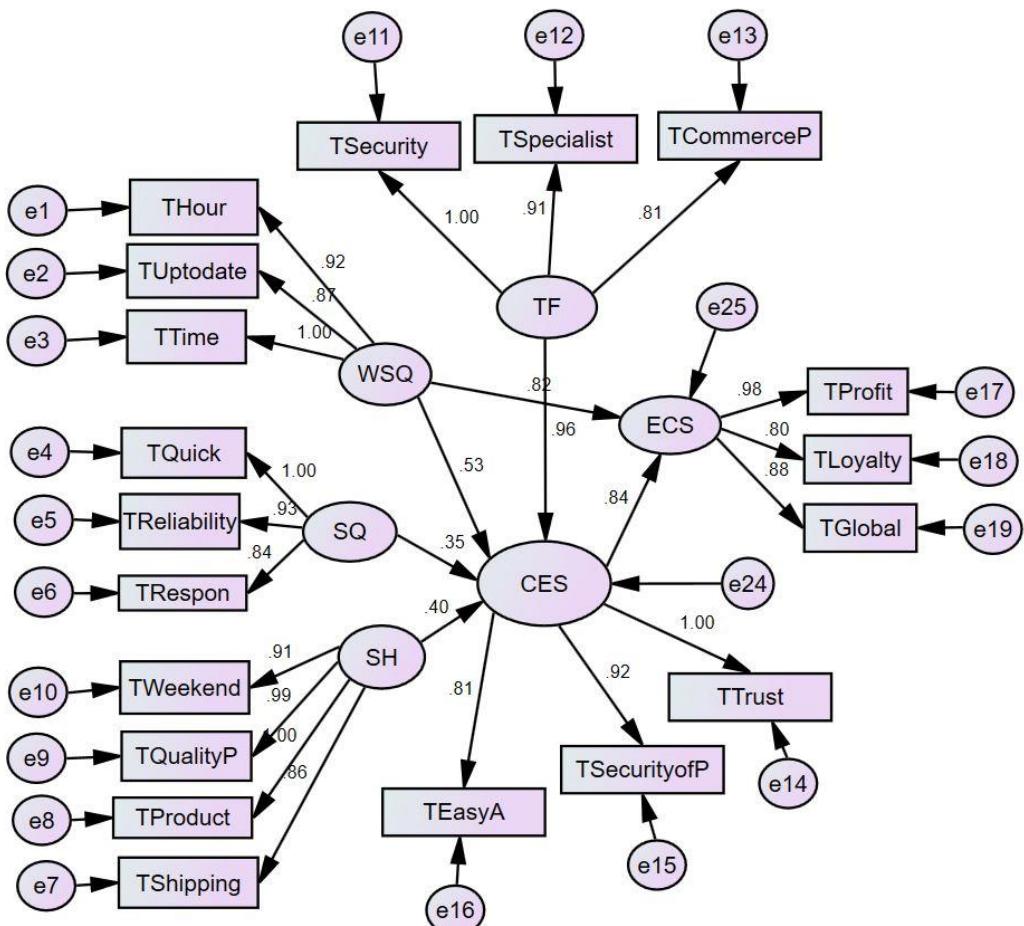
Qualitative Approach

Purposive sampling was employed to select sample groups from various business types within the electronic commerce sector. These included fashion and apparel, healthcare and pharmaceuticals, food and beverage, consumer goods, computer and IT equipment, gaming and toys, and tourism and hospitality, among others. The selection criteria prioritized businesses with the highest profitability, sourced from the Department of Business Development database in 2022. In-depth interviews were conducted with 400 selected businesses to gather qualitative data. A questionnaire development process involved identifying and embedding six factors: website service quality, overall service quality, transportation, technological factors, customer satisfaction, and e-commerce success. The questionnaire underwent reliability testing using the alpha-coefficient method proposed by Cronbach (1990). A trial run with 73 questionnaire items was administered to 30 non-sample electronic commerce businesses, ensuring each variable achieved an alpha coefficient of at least 0.70 to establish questionnaire reliability, as recommended by Hair et al. (2010). The overall reliability coefficient for the questionnaire was found to be 0.875, with individual variable coefficients ranging from 0.753 to 0.897.

Results

From this study, it was found that the most influential factors in conducting electronic commerce businesses across all six aspects had an average rating as follows: Website Service Quality: High (Mean = 4.07) Service Quality: High (Mean = 4.06) Shipping: High (Mean = 4.03) Technology Factor: High (Mean = 4.02) Customer E-commerce Satisfaction: High (Mean = 4.05) E-Commerce Success: High (Mean = 4.01). Furthermore, the analysis of the structural equation model regarding the variables influencing the causal relationships affecting the success of

electronic commerce businesses in the digital transformation era revealed that the model was consistent with the empirical data or statistically congruent, as shown in the diagram below.



Chi-square = 1.867, df = 2.051, p = .537

CMIN/DF = 2.854, GFI = .907, AGFI = .880, RMSEA = .042

Figure 2 The Structural Equation Modeling

Table 1 Evaluating the Data–Model Fit

Evaluating the Data–Model Fit	Sign	Criteria Reference	Result	Interpretation
χ^2/df	χ^2/df	<3.00	1.867	Pass
P–Vales	P–Vales	>0.05	0.537	Pass
Comparative Fit Index	CFI	>0.90	0.931	Pass
Goodness of Fit Index	GFI	>0.90	0.907	Pass
Root Mean Square Error of Approx.	RMSEA	<0.05	0.042	Pass
Root Mean Square Residual	RMR	<0.05	0.021	Pass

Figures 2 and Table 1 The examination of the structural equation model's fit indices before and after model adjustment reveals that the statistics after model adjustment, as computed by the AMOS software, indicate a statistically insignificant difference from zero. The chi-square value is 1.867 with degrees of freedom (df) of 2.051 and a p-value of 0.537, suggesting a good fit. Additionally, the goodness–of–fit index (GFI) is 0.907, the adjusted goodness–of–fit index (AGFI) is 0.880, and the root mean square error of approximation (RMSEA) is 0.042.

Table 2 The direct influence, the indirect influence, and the total of the influence

Antecedents	Consequences					
	Customer E-commerce			E-Commerce Success		
	Satisfaction (CES)			(ECS)		
	DE	IE	TE	DE	IE	TE
1. Website Service Quality: WSQ	.334	–	.334	.377	.088	.465
2. Service Quality: SQ	.207	–	.207	–	.085	.085
3. Shipping: SH	.232	–	.232	–	.205	.205
4. Technology Factor: TF	.321	–	.321	.342	.081	.423
5. Customer E-commerce Satisfaction: CES	–	–	–	.324	–	.324
6. E-Commerce Success: ECS	–	–	–	–	–	–

Table 2: Standardized weights of direct, indirect, and total effects between the causal variables and outcome variables of the relationship influencing the success of e-commerce businesses in the digital transformation era are presented as follows:

Hypothesis 1: Website service quality positively influences e-commerce success. Direct effect: Website Service Quality (WSQ) positively affects E-Commerce Success (ECS) with a standardized coefficient of 0.377. Indirect effect: WSQ has an indirect effect on ECS with a standardized coefficient of 0.88. Total effect: The total effect of WSQ on ECS is 0.550, indicating statistical significance at the 0.01 level. Therefore, Hypothesis 1 is accepted.

Hypothesis 2: Website service quality positively influences customer e-commerce satisfaction. Direct effect: Website Service Quality (WSQ) has a positive direct effect on Customer E-commerce Satisfaction (CES) with a standardized coefficient of 0.334. Total effect: The total effect of WSQ on CES is 0.334, indicating statistical significance at the 0.01 level. Therefore, Hypothesis 2 is accepted.

Hypothesis 3: Service quality positively influences customer e-commerce satisfaction. Direct effect: Service Quality (SQ) positively affects CES with a standardized coefficient of 0.207. Total effect: The total effect of SQ on CES is 0.207, indicating statistical significance at the 0.01 level. Therefore, Hypothesis 3 is accepted.

Hypothesis 4: Shipping positively influences customer e-commerce satisfaction. Direct effect: Shipping (SH) positively affects CES with a standardized coefficient of 0.232. Total effect: The total effect of SH on CES is 0.232, indicating statistical significance at the 0.01 level. Therefore, Hypothesis 4 is accepted.

Hypothesis 5: Customer e-commerce satisfaction positively influences e-commerce success. Direct effect: Customer E-commerce Satisfaction (CES) positively affects E-Commerce Success (ECS) with a standardized coefficient of 0.324. Total effect: The total effect of CES on ECS is 0.324, indicating statistical significance at the 0.01 level. Therefore, Hypothesis 5 is accepted.

Hypothesis 6: The technology factor positively influences customer e-commerce satisfaction. Direct effect: Technology Factor (TF) positively affects CES with a standardized coefficient of 0.321. Total effect: The total effect of TF on CES is 0.321, indicating statistical significance at the 0.01 level. Therefore, Hypothesis 6 is accepted.

Hypothesis 7: The technology factor positively influences e-commerce success. Direct effect: Technology Factor (TF) positively affects E-Commerce Success (ECS) with a standardized coefficient of 0.324. Total effect: The total effect of TF on ECS is 0.324, indicating statistical significance at the 0.01 level. Therefore, Hypothesis 7 is accepted.

Quantitative Research

This research project conducted qualitative research to study and analyze causal relationships that influence the success of electronic commerce businesses in the era of digital transformation. The qualitative research involved in-depth interviews with electronic commerce business practitioners who met the quality standards and operated across different regions in 2565. There were eight groups of businesses, including fashion and apparel, health and wellness, pharmaceuticals, food and beverages, consumer goods, computer and IT equipment, gaming and toys, tourism and hotel businesses, and other types of businesses (such as maternity and baby products, cultural and arts businesses, and scientific tool-related businesses). These businesses had the highest net profits in 2565.

Here are the summarized findings from the interviews:

Issue 1: Quality of website service Respondents stated that their companies provided services by presenting interesting and up-to-date information on their websites, ensuring reliability, and promptly responding to customer needs. This approach aimed to maximize customer satisfaction and increase profits.

Issue 2: Company management Companies planned warehouse systems to facilitate rapid and quality product delivery, and provided useful information and guidance to customers before and after purchases, leading to high customer satisfaction and repeat purchases.

Issue 3: Product delivery management Companies focused on providing fast and secure delivery to meet customer demands, often offering free shipping under certain conditions and maintaining strict quality standards in product delivery processes.

Issue 4 : Technology management Companies utilize technology to manage customer databases securely and track, manage, and deliver products quickly and accurately. They also used technology to create online platforms for communication, marketing, and efficient sales.

Issue 5: Customer service management Companies provide customer service before and after purchases through experienced and knowledgeable staff, offering guidance on product selection to impress customers and encourage repeat purchases.

Issue 6 : Operational planning Companies continuously study environmental, social, and economic data to plan operations and develop new products that meet customer needs while focusing on quality and efficiency. They adjusted production processes to remain flexible amidst changing conditions, aiming to ensure business continuity without impacting employees and maintaining customer loyalty.

Issue 7: Future success strategies Respondents believed that developing sales platforms using technology would enhance the efficiency of e-commerce across various business types, enabling quick access to target audiences and offering modern, efficient, and secure transactions. Additionally, focusing on developing applications that meet the specific needs of each business type was seen as a promising strategy.

Discussion

The research findings reveal that the model of causal relationships that influence the success of electronic commerce businesses in the era of digital transformation aims to study and analyze the causal relationships that influence the success of electronic commerce businesses in the era of digital transformation and to create a model of electronic commerce businesses in the era of digital transformation. From the analysis of the structural equation modeling linkages, the testing of the 7 hypotheses yielded the following details:

Website service quality directly influences the success of e-commerce, consistent with Sharma and Aggarwal (2019), who found that online success can be measured by customer satisfaction, delight, and recommendations to others.

Website service quality directly affects customer satisfaction, aligned with Biswas et al. (2019), who found that measuring customer satisfaction with online shopping is crucial as it leads to customer delight and repeat purchases.

Service quality directly influences customer satisfaction, consistent with Dirgantari et al. (2018), who found that business success comes from having good data service systems, fast and accurate communication, and easy-to-understand communication that greatly pleases customers.

Transportation quality directly influences customer satisfaction, consistent with Vasić, N. et al., (2019), who found that customer satisfaction with online shopping depends on various factors, with transportation being a crucial factor that generates customer satisfaction through fast and timely service.

Customer satisfaction directly influences the success of e-commerce, aligned with Choshin and Ghaffari (2017), who found that online service is about maintaining and enhancing efficiency among customers, focusing on customer satisfaction as a priority as it leads to company profitability.

Technology factors directly influence customer satisfaction, consistent with Luhur Prianto et al. (2020), found that integrating technology into operations builds confidence, security, and system efficiency that leads to customer satisfaction.

Technology factors directly influence the success of e-commerce, aligned with Kanchanopast (2014), who found that business success is influenced by various factors, especially in technology, which can help develop systems to be modern, interesting, and accessible to customers.

New Knowledge

The research emphasizes the importance of the relationship between various factors, such as website service quality, general service quality, transportation quality, customer satisfaction, and technological factors, that impact the success of e-commerce businesses in the digital transformation era.

The direct impact of service quality: The study focuses on examining the direct impact of service quality, including website service quality and transportation quality, on customer satisfaction and the success of e-commerce startups.

Customer satisfaction as a key factor: The research underscores the significance of customer satisfaction in the success of e-commerce businesses. Satisfied customers are more likely to make repeat purchases, contributing to long-term success.

Role of technology in enhancing efficiency: The research highlights the crucial role of technology in improving operational efficiency and customer satisfaction in e-commerce ventures. Utilizing contemporary technology is essential for meeting customer expectations and staying competitive in the digital market.

Importance of adaptability in digital transformation: The study stresses the importance of adaptability and responsiveness to digital transformation trends. E-commerce businesses must continuously improve their operations to leverage emerging technologies and evolving customer preferences.

From studying and understanding this relationship e-commerce business owners can plan Develop strategies and take action by using the factors studied to help adjust the operating system of the business. Move towards business success in the rapidly changing digital market. and resulting in greater profits as well.

All the new knowledge that has been described Can be displayed as a model as shown in Figure 3.

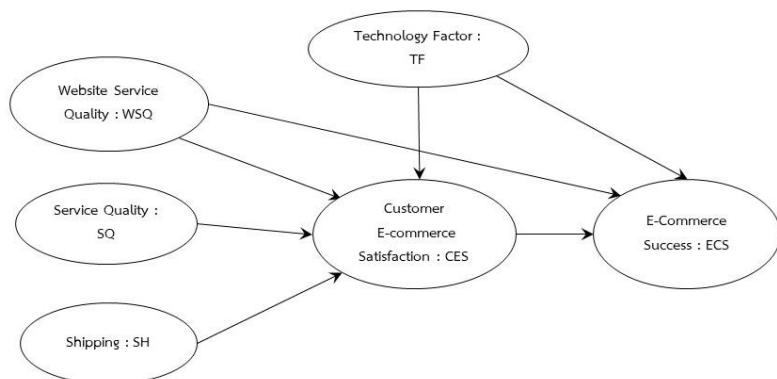


Figure 3 New model images obtained from studies and literature reviews

Conclusion

This research examines causal relationships that influence the success of electronic commerce businesses in the era of digital transformation. The first objective is to study and analyze the causal relationships that influence the success of e-commerce businesses in the era of digital transformation and to develop a model of electronic commerce business success in the era of digital transformation. The researchers studied data, concepts, theories, and related research that had been previously studied to identify gaps in existing research, leading to the development of new research framework concepts. This resulted in a causal relationship model influencing the success of electronic commerce businesses in the digital transformation era, consisting of website service quality, service quality, shipping, customer electronic commerce satisfaction, technology factors, and electronic commerce success.

Furthermore, the researchers developed all 7 research hypotheses to guide model development and analysis of relevant factors. The second objective is to build a model of electronic commerce business success in the digital transformation era. The researchers created a model and tested the relationship between data and the framework, verifying the consistency of all models. The analysis involved examining the relationship between observed variables and latent variables. The test results showed that the model was suitable in terms of goodness of fit and aligned well with observational data, reaching an acceptable level of model acceptance.

Suggestion

Research on causal relationships that influence the success of electronic commerce businesses in the era of digital transformation. There are research suggestions, as follows:

Market and Customer Understanding: Businesses should deeply analyze customer behaviors in the digital realm, study competitors, and market opportunities to adapt to new trends efficiently, and develop suitable marketing strategies.

Data Utilization in Decision Making: Efficient use of relevant data for business analysis and decision-making, leveraging technologies such as university analytics, big data, and AI for market trend prediction and product development to meet customer needs.

Development and Services: Integrating digital technology into product and service offerings to efficiently meet customer demands, including the development of applications and efficient delivery systems.

Partnering for Expertise: Building partnerships with digital technology companies to access expertise and technologies beyond the business's capabilities, enhancing competitiveness in the market.

Skill Development and Organizational Knowledge: Providing employees with understanding and expertise in digital technology and transformations to adapt to new technologies and build confidence in digital business operations.

Creating Flexible and Adaptive Work Environments: Establishing flexible organizational structures capable of rapid adaptation to market or technological changes, emphasizing a culture that supports innovation and embraces change as crucial for business operations.

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