


STRUCTURAL EQUATION MODEL OF THE VARIABLES AFFECTING THE BUSINESS PERFORMANCE OF THE RETAIL READY-MADE GARMENT BUSINESS BY E-BUSINESS ADOPTION IN THAILAND

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ARTICLE INFO	ABSTRACT
<p>Article history: Received: January, 02nd 2024 Accepted: February 26th 2024</p>	<p>Purpose: The objective of this research was to study the influences that affect the business performance of the retail ready-made garment businesses in Thailand.</p> <p>Method: The study focused on the use of a qualitative method with a questionnaire as the tool for data collection from a sample of 400 retail ready-made garment businesses. Data analyses included descriptive statistics and multiple regression analysis.</p>
<p>Keywords: Firm Characteristics; Innovation Characteristics; E-business Adoption; Business Performance.</p> <div data-bbox="169 965 480 1216" data-label="Image">  </div>	<p>Results and Discussions: The factors with the highest means are Customization (mean 5.47), Transactions (mean 5.36), and Supplier Connection (mean 5.30). The multiple regression analysis demonstrated that Customization, Supplier Connection, and Information influence the business performance of retail ready-made garment businesses in Thailand with statistical significance, whereas Transactions do not. Nevertheless, it was also revealed that, in the operation of retail ready-made garment businesses, the value chain for e-businesses includes business performance, production, logistics, the infrastructure of human resources, and finance. E-business adoption influences business performance by beneficially leading to efficient operations and the sustainable growth of organizations.</p> <p>Research Implications: This disruption, thus, is an opportunity and destruction, which is a challenge for business. Therefore, the business should set the goal for sustainable development by adopting e-business as the key tool to drive the national economy. Furthermore, the use of big data or data analytics would upgrade business efficiency the same as the use of artificial intelligence (AI) that would support business operations, human resource management, and customer information management. Nevertheless, other factors affecting business growth are the use of various platforms, marketing strategies that access the customer widely, reliable services, adoption of technology to e-commerce, and skillful personnel in e-commerce, which would have sustainable positive impacts on the business operation.</p> <p>Originality/Value: Due to the change in customers' behavior to become online users, the government sector should set the policy and provide aid to promote the knowledge to the people for employment and careers from the online business that would maximize the value of e-business in Thailand.</p> <p>Doi: https://doi.org/10.26668/businessreview/2024.v9i4.4494</p>

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MODELO DE EQUAÇÃO ESTRUTURAL DAS VARIÁVEIS QUE AFETAM O DESEMPENHO COMERCIAL DO NEGÓCIO DE VAREJO DE ROUPAS PRONTAS PARA USO POR MEIO DA ADOÇÃO DO E-BUSINESS NA TAILÂNDIA

RESUMO

Objetivo: O objetivo desta pesquisa foi estudar as influências que afetam o desempenho comercial das empresas de varejo de roupas prontas na Tailândia.

Método: O estudo se concentrou no uso de um método qualitativo com um questionário como ferramenta para a coleta de dados de uma amostra de 400 empresas de varejo de roupas prontas. As análises de dados incluíram estatísticas descritivas e análise de regressão múltipla.

Resultados e Discussões: Os fatores com as médias mais altas são Personalização (média 5,47), Transações (média 5,36) e Conexão com o fornecedor (média 5,30). A análise de regressão múltipla demonstrou que a Personalização, a Conexão com o Fornecedor e as Informações influenciam o desempenho comercial das empresas de varejo de roupas prontas na Tailândia com significância estatística, enquanto as Transações não influenciam. No entanto, também foi revelado que, na operação de empresas de varejo de roupas prontas, a cadeia de valor dos negócios eletrônicos inclui desempenho comercial, produção, logística, infraestrutura de recursos humanos e finanças. A adoção do comércio eletrônico influencia o desempenho dos negócios, levando a operações eficientes e ao crescimento sustentável das organizações.

Implicações para a Pesquisa: Essa ruptura, portanto, é uma oportunidade e destruição, o que é um desafio para os negócios. Portanto, as empresas devem estabelecer a meta de desenvolvimento sustentável adotando o e-business como a principal ferramenta para impulsionar a economia nacional. Além disso, o uso do big data ou da análise de dados melhoraria a eficiência dos negócios, assim como o uso da inteligência artificial (IA), que daria suporte às operações comerciais, ao gerenciamento de recursos humanos e ao gerenciamento de informações dos clientes. No entanto, outros fatores que afetam o crescimento dos negócios são o uso de várias plataformas, estratégias de marketing que acessam amplamente o cliente, serviços confiáveis, adoção de tecnologia para o comércio eletrônico e pessoal qualificado em comércio eletrônico, o que teria impactos positivos sustentáveis na operação dos negócios.

Originalidade/Valor: Devido à mudança no comportamento dos clientes, que se tornam usuários on-line, o setor governamental deve definir a política e fornecer ajuda para promover o conhecimento para as pessoas em busca de emprego e carreiras no comércio on-line, o que maximizaria o valor do comércio eletrônico na Tailândia.

Palavras-chave: Características da Empresa, Características de Inovação, Adoção de Negócios Eletrônicos, Desempenho Comercial.

MODELO DE ECUACIONES ESTRUCTURALES DE LAS VARIABLES QUE AFECTAN AL RENDIMIENTO EMPRESARIAL DEL COMERCIO MINORISTA DE ROPA CONFECCIONADA MEDIANTE LA ADOPCIÓN DEL COMERCIO ELECTRÓNICO EN TAILANDIA

RESUMEN

Propósito: El objetivo de esta investigación era estudiar las influencias que afectan al rendimiento empresarial de las empresas minoristas de ropa confeccionada en Tailandia.

Método: El estudio se centró en el uso de un método cualitativo con un cuestionario como herramienta de recogida de datos de una muestra de 400 empresas minoristas de confección. Los datos se analizaron mediante estadística descriptiva y análisis de regresión múltiple.

Resultados y Discusión: Los factores con las medias más altas son Personalización (media 5,47), Transacciones (media 5,36) y Conexión con el proveedor (media 5,30). El análisis de regresión múltiple demostró que la personalización, la conexión con el proveedor y la información influyen con significación estadística en los resultados empresariales de las empresas minoristas de confección en Tailandia, mientras que las transacciones no lo hacen. No obstante, también se puso de manifiesto que, en el funcionamiento de las empresas minoristas de confección, la cadena de valor de los negocios electrónicos incluye el rendimiento empresarial, la producción, la logística, la infraestructura de recursos humanos y las finanzas. La adopción del negocio electrónico influye en el rendimiento empresarial al conducir de forma beneficiosa a operaciones eficientes y al crecimiento sostenible de las organizaciones.

Implicaciones de la Investigación: Esta disrupción, por tanto, es una oportunidad y una destrucción, lo que supone un reto para las empresas. Por lo tanto, las empresas deberían fijarse el objetivo del desarrollo sostenible adoptando el negocio electrónico como herramienta clave para impulsar la economía nacional. Además, el uso de big data o análisis de datos mejoraría la eficiencia empresarial, al igual que el uso de inteligencia artificial (IA), que apoyaría las operaciones empresariales, la gestión de recursos humanos y la gestión de la información de los clientes. No obstante, otros factores que afectan al crecimiento empresarial son el uso de diversas plataformas, las

estrategias de marketing que acceden ampliamente al cliente, los servicios fiables, la adopción de tecnología para el comercio electrónico y el personal cualificado en comercio electrónico, que tendrían impactos positivos sostenibles en el funcionamiento empresarial.

Originalidad/Valor: Debido al cambio en el comportamiento de los clientes para convertirse en usuarios en línea, el sector gubernamental debe establecer la política y proporcionar ayuda para promover el conocimiento a las personas para el empleo y las carreras de los negocios en línea que maximizaría el valor de los negocios electrónicos en Tailandia.

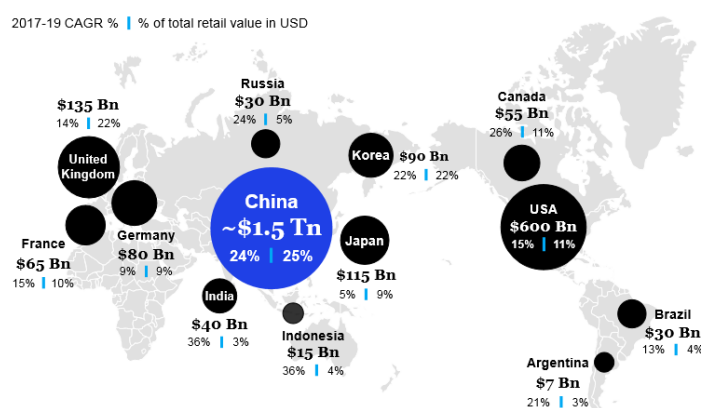
Palabras clave: Características de la Empresa, Características de la Innovación, Adopción del Negocio Electrónico, Rendimiento Empresarial.

1 INTRODUCTION

Currently, the largest garment markets are in developed countries although the growth of the sales volume is slow or negative. Other markets involve those that are emerging; such as China, India, South Korea, Taiwan, Thailand, Indonesia, Malaysia, the Philippines, and Vietnam. Furthermore, China and India are the countries with the highest demand for ready-made garments. As a result, there is a gap in the growth of the ready-made garment market and the industries related to the technologies, particularly online sales which substitute physical shop sales (Figure 1).

Figure 1

Online retail transaction value [1]



Source: Lambert Bu, 2019

Moreover, customer behavior has changed, as consumers are purchasing more from online sales with males buying more online garments; the growth of children's wear is also very dramatic. The increasing sales volume of garments is the result of the consumption of the teenager group and simpler access to the brands. The expansion of e-commerce in small towns and department stores indicates the fashion trends to the buyer. For this reason, many brands

only focus on online marketing. The world's leading B2B business review platform, which revealed the trend of online sales in the USA that 51% of Americans preferred online purchases. Millennials or Gen Y and Generation X or Gen X people spend 50% more time on online shopping than people from the Baby Boomer group to buy items for their daily life. The offline purchase is for a product that only fulfills a personal demand or luxurious experience. Simultaneously, the consumer still has the demand for the omnichannel or the integration of online and offline sales, which gives a seamlessly positive experience to the customer. With this channel, the customer has more convenient alternatives. For instance, the customer might order online and collect the product from a physical shop, or order at the physical shop and use a home delivery service. Currently, 85% of the buyers in the garment e-commerce sales purchase from online and offline channels, which is a 5% increase over 2017 [1].

Furthermore, during the past few years, there have been continuous updates on the closing of branches of retail shops worldwide, both minor and major leading brands. The information from Coresight Research [2], a market research company in the USA, indicated that 4,810 branches of retail businesses in the USA were closed at the beginning of 2019. That is to say the retail business is currently being disrupted or ruined by digital and new innovative technologies. Thus, it can be seen that the retail business will have more collaboration with tech startups in the future to leverage the technologies and innovations to upgrade to be an efficient business. The intense competition and customer behavior are the factors encouraging sellers to develop and generate more investment in transforming their business in the digital era. Gartner, Inc. [3], a world leading research and consulting company, predicted the technology expenses in the retail business sector around the world and found that it would expand 3.6% in 2019, accounting for 203.06 billion USD and would have a similar growth ratio in the next two years. Software investment would also have the most expansion and growth of the technology expenses.

However, there are many new faces of retail and wholesale garment entrepreneurs in Thailand; such as, the group of designers who manufacture and distribute their products by themselves at a shop decorated in a unique style to suit the garment, on the Internet, or at importing garment shops. Nevertheless, to survive in this business is not simple. A number of entrepreneurs are unsuccessful in business because the retail business and SMEs in Thailand lack development and knowledge (know-how) to enhance the competitiveness. Additionally, the business does not implement any strategies and/or the Internet for the business, use business technology to reduce the costs, increase productivity, and fulfill the customers' demands

promptly [4]. Today, the implementation of e-business is very crucial because it supports the efficiency and effectiveness of a business's operations. Moreover, the study on the acceptance of e-business adoption and value has become a research topic of the utilization of an information system (IS) [5], and e-business is to use the Internet to operate or promote business activities based on the value chain concept [6]. Porter [7] proposed the sales marketing, supply, collaboration and operation concept within the retail firms that were aware of the marketing activities and the value chain of an efficient operation, production, logistics, infrastructure, human resources, and finance [8]. For this reason, the researcher would like to study the model for the structural equation of the variables affecting the performance of the retail ready-made garment business by e-business adoption in Thailand to gain academic information that could be applied as a guideline for the retail ready-made garment entrepreneur, as well as other retail businesses and business sectors to set the strategies to enhance the performance efficiency and to propose the recommendations to the government regarding aid for the retail ready-made garment entrepreneurs who have encountered pressure from unstable domestic and international business circumstances.

Objectives

1. To study the direct, indirect, and total impacts of the variables affecting the performance of the retail ready-made garment business by e-business adoption in Thailand.
2. To develop the structure equation model (SEM) of the variables affecting the performance of the retail ready-made garment business by e-business adoption in Thailand.

2 THEORETICAL FRAMEWORK

Thailand has initiated the digital economy policy to drive the modern economy to correspond with the policies, strategies, and projects, especially in the digital era where information is the key tool for generating predictions and making decisions on administrative policy and the direction of the organization and nation [9]. The textile and garment industries in Thailand are pressured by their competitors and the government sector to be more aware of brand significance, understanding of the market demand, and the potential of Thai entrepreneurs to develop them to become original brand manufacturers and perform their business sustainably. Furthermore, the domestic markets are influenced by the online channel, which is very popular today, as well as other technologies that support convenient and quick

purchases. The international markets, such as the USA, Europe, and Asia have a constant demand for importing from Thailand.

Rogers [10] explained about the diffusion of innovation (DOI) that as time passed and the idea or momentum of the product increased and was diffused to a specific group of people or social system, the people, who were a part of that social system, applied a new behavioral concept or products. Malinverni et al., [11] discovered that acceptance was classified into Innovators, Early Adopters, Early Majority, Late Majority, and Laggards. Moreover, the technology-organization-environment (TOE) framework was developed and explained as the process of deciding to apply technology to the system and the system's installation. The factors affecting the decision-making to apply the technologies were the technological, organizational and environmental factors. However, the application of e-business and the information system (IS), as well as the acceptance of the electronic structure to business; such as, e-procurement [12], e-commerce [13], e-market [14] and e-supply chain [15], and the use of an innovative information system; such as; cloud computing [16, 17] and the Internet of Things (IoT) [18], resulted in efficient performance.

2.1 FIRM CHARACTERISTICS

Firm characteristics are determined within the framework employing the organizational management and system of the main organization, which comprises management processes, organizational culture, and organizational systems [19]. Firm characteristics refer to the quality of the business that transforms the production factors to the products or services using the strategy emphasizing the products or target markets to the organizational value construct to upgrade the efficiency and promote the business growth [20]. In previous research, firm characteristics were generally utilized because they had a high impact on the acceptance of innovation applications. Organizational characteristics consist of the firm size, top management support, and expectation of utilization [21]. Firm characteristics refer to the resources of the firm, size of the firm, managerial structure, and internal coordination [15, 16, 17]. Ling [24] discovered that a small business had a less complex organizational structure and less chance of accepting new technology due to the lack of resources and the impact of external factors. On the other hand, a large-size firm had the resources and infrastructure that facilitated and eased the business operation and accepted new technologies and innovation. Moreover, Lertwongsatien & Wongpinunwatana [25] found that large-size firms were likely to accept

more innovations because they were able to handle the risk, and had sufficient resources and infrastructure to ensure the innovation adoption. In addition, the age of the organization affected the business. A new business had a high feasibility of growth. Similarly, a young owner or manager was likely to achieve more success than an older owner. As such, the growth of the business was the result of the impact of the business and the owner's or manager's characteristics [26]. The firm characteristics in terms of the owner's or manager's characteristics and components of the establishment. They found that the components of the establishment, which included the age of the business, number of owners, complexity of the organizational structure, process, capital, number of employees, and the period of aid, were related to the business efficiency. Furthermore, the use of different strategies; such as, a low-cost strategy, differentiation, target market, and development, were significantly different to the growth of the return rate, sales volume, returns from the total assets, and investment return. The application of new technologies was likely to receive more acceptance from the employees; additionally, the top management played an important role in implementing the innovations in the business [25]. The top management could encourage the change of technologies to be more accepted by the employees by setting an obvious clear vision of the organization [27]. In an organization where the top management supports information technology, the concerned personnel and divisions would be willing to perform their functions at full capacity, which would finally result in efficient and effective performance [28]. From the review of the relevant literature to the firm characteristics, the previous studies examined the following observed variables that applied to this current research.

1. Firm size refers to the difference of the organization in the use of production factors; such as capital, labor, and machinery, to construct the organization to have efficient performance.
2. Top management support refers to the essence that ensures the interest and attention of the executive in the resources and environmental development in the organization that facilitates the adoption of technologies and innovations. This was the key tool to overcome any obstacles and technological changes.
3. Expected benefits of e-business referred to the factor to acquire the acceptance in e-business within and outside the firm [15, 16, 29, 30].

2.2 INNOVATION CHARACTERISTICS

Innovation is an influential concept in the economy and society. Innovation creates new things and is considered as the fundamental strategy to sustainably maximize the firm's potential and competitiveness [31, 32]. Therefore, innovation is accepted by organizations and firms as a tool to construct success. Schumpeter [33] defined innovation as comprising five new components: a new product or new quality of the existing product, a new production process proposed to the industry, new market exploration, new organizational change, and the development of raw material and input. Additionally, innovation refers to the introduction of new things or methods that combine, integrate, or synthesize current knowledge or newly discovered knowledge. It was also the process of applying useful ideas and changing the concepts to produce and add value to the product, service, or work procedure [10]. Moreover, innovation was the key strategy to create competitive advantages and efficient performance since the firm constantly proposed new products, services, and work procedures to the customer [31, 32]. Roger [22] proposed that innovation characteristics comprised five components. Firstly, a comparative benefit refers to the organization or individual who perceived that innovation was a better thing or had more benefits than what was currently in place. Secondly, compatibility refers to the level that the innovation was considered to be under the current technology or work procedure. Thirdly, a complexity that referred to the level that the innovation was considered to be difficult to use or understand. Fourthly, trialability refers to the level at which innovation was applied to the condition. Fifthly, noticeability refers to the level of the outcome that was visible to others; the greater the innovation outcome, the more acceptance. However, Wu et al. [28] indicated that the factors of a successful business involved the difference of the business, innovations, the environmental context, and more importantly, the adoption of e-business, which differentiated the entrepreneur from others [27, 34]. From the review of the relevant literature to the innovation characteristics, the previous studies examined the following observed variables that applied to the current research.

1. Relative advantage refers to the perception of the benefits of the innovations or innovation acceptance, which the acceptor compared to other proposals, in terms of status, usage simplicity, and low price.
2. Perceived compatibility refers to the perception of the innovation receiver's view that the innovation matched and was appropriate for them in various aspects; such as the norm, tradition, culture, and skills.

3. Perceived complexity refers to the level the acceptance of technology to simplify its use to leverage its acceptance.

Trialability refers to the factors determining the quantity or the success and whether it fulfilled the demand or expectation. This was the factor affecting the perceived benefits of information technology. [10, 27, 29, 30, 35]

2.3 E-BUSINESS ADOPTION

Electronic business or e-business was first used by IBM in 1997 to substitute the word E-commerce [36]. E-business was explained as a form of products and services traded on digital media. E-business involves the use of the Internet and technology to provide convenience in buying and selling through the Intranet, Extranet, and Internet. The acceptance of the consumer of the innovations and technologies (adoption and innovation theory) is called the acceptance process, which refers to the behavior of the individual in society exhibiting the acceptance to perform [37]. Lin and Lee [34] stated that the level of e-business adaptation was valuable and used to comprehend the issues related to the e-business system, which involved five levels: beginning, breeding, networking, business combination, and business change, respectively. Moreover, e-business adoption was to operate the business with an electronic system. The acceptance of e-business expanded the market to serve customers worldwide and constructed global marketing relations, which upgraded firm competitiveness and economic growth [38, 6]. The use of Internet applications for communication, and internal and international business management was essential to observe the diffusion of e-business from the internal and external perspectives [15]. Furthermore, the use of electronic media was the procedure to buy, sell, and exchange products, services, and information through an Internet network [35] and supply chain [39]. The learning and knowledge management of the personnel in the organization to e-business adoption constructed the learning, network, and knowledge transfer to the related businesses [34]. Ilin et al. [27] investigated the factors of e-business adaptation in the firms that used and did not use ERP and found that the results displayed statistically significant differences. In addition, they discovered that the diffusion of the electronic system in supply chain management had positive impacts on the organization's efficiency [40]. From the review of the relevant literature on e-business adoption, the previous studies examined the following observed variables that applied to the current research.

1. Information refers to the presentation of the key information of a product or service to the relevant person to utilize.
2. Transaction refers to the activity derived from the decision to purchase followed by the purchasing step, searching for the raw material supplier, the purchasing order, and following up the purchasing order through an online system.
3. Customization referred to the activity that satisfies the customers and fulfills the customers' demands.
4. Supplier connection refers to the factors supporting the use of e-business within and outside the firm. [6, 18, 28, 41]

2.4 BUSINESS PERFORMANCE

Measuring competitiveness with financial performance might not reflect true competitiveness. Initially, the method used was a balanced scorecard (BSC), which was a managerial tool to evaluate the organization for its strategic implementation starting from the vision, mission, and strategies, which were the steps to set the important factors of success. The BSC was also used for strategic planning [42] to develop the organization and evaluate through the perspective of a measuring and evaluation system in four main aspects, which included the Financial Perspective, Customer Perspective, Internal Perspective, and Learning and Growth [43]. Then, the key performance indicators (KPI) were created to indicate the goal and assess the performance that was important to the strategy [44]. Furthermore, Wu et al. [28] proposed that the evaluation consisted of four dimensions: efficiency, sales performance, customer satisfaction, and relationship development. Moreover, Koellinger [45] studied the link between technology, innovation, and efficiency of the firm in e-business adoption. He found that this connection was similar to the use of e-business to integrate the supply chain and evaluate it by using the BSC [46, 47]. However, the study on the diffusion of innovations showed that information technology affected the efficiency of the BSc by applying the technology to business operations [43]. This was in line with Tsou and Hsu [48] who discovered that there were impacts on the efficiency of technological organization openness, environment of service production, and the preparedness of the digital resource of e-business. From the review of the relevant literature to the business performance, the previous studies examined the following observed variables that were applicable to the current research.

1. Financial perspective refers to the perspective representing the cost used for upgrading the performance.
2. Customer perspective refers to customer care and value creation to the customer to construct satisfaction in the product, which leads to the value added to the business.
3. Internal processes perspective refers to the perspective on the business showing the efficiency of the organization and the performance of the employees.
4. Innovation learning and growth perspective refers to the development of knowledge and capability of the employees, employees' satisfaction and attitude, work skills, facilities, and turnover rate. [46, 49, 50, 51]

The literature review resulted in the following hypotheses (Figure 2):

Hypothesis 1 (H1): Firm characteristics affect the business performance.

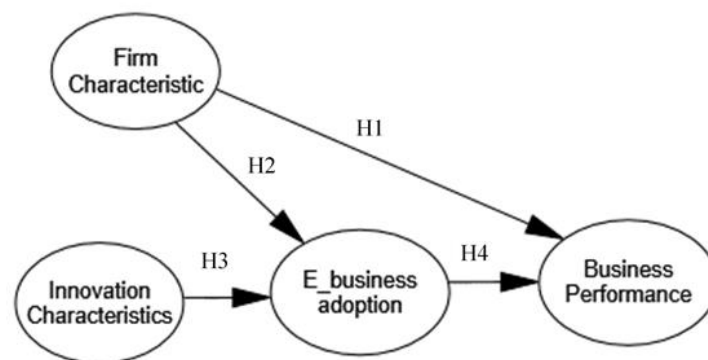
Hypothesis 2 (H2): Firm characteristics affect the e-business adoption.

Hypothesis 3 (H3): Innovation characteristics affect the e-business adoption.

Hypothesis 4 (H4): E-business adoption affects the business performance.

Figure 2

Conceptual framework



Source: Researchers, 2024

3 METHODOLOGY

The researcher gathered the primary and secondary data and applied mixed research methodology, quantitative research, and qualitative research using an in-depth interview with the executives or experts in the retail ready-made garment business to support the results of the quantitative research.

3.1 QUESTIONNAIRE DESIGN

The questionnaire was used as the research tool to collect the data. After the literature review, the data were analyzed and a seven-point Likert scale questionnaire was created [52], which included the statement related to the studied aspect (Table 1). Then, the context validity and index of item objective congruence (IOC) was conducted by five experts. The questions with an IOC of .5 and more were selected [53]. The reliability was tested by distributing the questionnaire to 30 samples and analyzed with the Cronbach α -coefficient. The results showed that Cronbach's Alpha was .957, which a value higher than .70 was considered to have high reliability [54]. Therefore, the questionnaire was used to collect the data.

Table 1

Creating the measures and questions

Latent /Manifest Variables	Development
Firm characteristics 1) Firm size) 2) Top management support 3) Expected benefits of e-business	6, 15, 16, 17, 27, 28, 29, 48
Innovation characteristics 1) Perceived relative advantage 2) Perceived compatibility 3) Perceived complexity 4) Perceived trialability	27, 29, 30, 35, 57
E-Business adoption 1) Information 2) Transaction 3) Customization 4) Supplier connection	6, 18, 27, 28, 34, 39, 41, 43
Business performance 1) Financial perspective 2) Customer perspective 3) Internal processes perspective 4) Learning and growth perspective	6, 28, 43, 45, 46, 47, 48, 56

Source: Researcher, 2024

3.2 DATA COLLECTION

The quantitative research applied the survey, in which the population or analysis unit was the retail garment entrepreneurs who had registered with the Department of Commercial Registration, and were selected by probability sampling. The sample was selected by stratified sampling and simple random sampling to obtain the sample as per the ratio of the targeted sample group size and population classified by the region of the entrepreneur. The questionnaire was used to collect the data to find the concept of the sample group. The qualitative research

method used the literature review, concept, theories, and policies analysis, as well as an in-depth interview with the executives or experts in the retail ready-made garment business. The size of the sample group was appropriate for the accurate estimation and represented the population; thus, it was set at the ratio of 20 samples per one variable; 15 variables x 20 = 300 samples [57]. The data displayed a normal curve [58], and the statistics used to analyze the relationship of the variables were the structural equation model (SEM) and hypothesis test.

3.3 DATA ANALYSIS

This research set the reliability at 95 or the error (α) at .05 in the statistics test or the error acceptance at 5%. The analysis of the statistics of the sample group was to know the distribution by using descriptive statistics. The convergent validity of the factor was considered from the standard regression weights with the statistical significance or critical ratio (CR), or t -test ≥ 1.96 [59, 60], which exhibited that the measure had content validity. The analysis on the SEM was the technique to analyze the multivariate variables, which was the combination of factor analysis and multiple regression. The relationship of the variable was immediately verified [58] using the maximum likelihood estimation (ML). The results of the goodness of fit measures used the acceptable standard criteria [57, 58] (Table 2).

4 RESULTS AND DISCUSSIONS

The analysis of the result of Pearson's product-moment correlation, the test of the observed variables if they were the identity matrix, and the factor level (Table 3), indicated that the factor with the highest value was Financial (mean=5.66; SD.=1.133) and that with the least value was Benefits (mean=4.97; SD.=1.278). The analysis result of the correlation showed that the relationship between the observed variables was .426 – .866 with a statistical significance of .01. The relationship should not be over 0.9, which the relationship level was too high [58]. When considering the Bartlett's Test of Sphericity (Table 2), it was found that the value was 5319.258 ($p=.000$), which indicated that the correlation matrix was different from the identity matrix with a statistical significance of .01. This was in line with the analysis result of Kaiser-Meyer-Olkin, which the value was close to 1 (KMO = .918). This implied that the manifest variables were appropriate for testing the consistency of the goodness of fit measures.

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Table 2*KMO and Bartlett's Test*

Kaiser-Meyer-Olkin Measure of the Sampling Adequacy.		.918
Bartlett's Test of Sphericity	Approx. Chi-Square	5319.258
	df	105
	Sig.	.000

Source: Researcher, 2024

Table 3*Mean, standard deviation and Pearson's correlation*

Source: Researcher, 2024	X	SD	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15
Firm size: X1	5.35	1.136	1	.741**	.692**	.675**	.644**	.583**	.538**	.458**	.490**	.529**	.524**	.529**	.542**	.584**	.487**
Top: X2	5.14	1.118		1	.800**	.559**	.604**	.714**	.613**	.462**	.494**	.569**	.484**	.496**	.516**	.601**	.618**
Benefits: X3	4.97	1.278			1	.493**	.575**	.618**	.643**	.486**	.473**	.510**	.477**	.454**	.461**	.549**	.557**
Relative: X4	5.45	1.225				1	.763**	.784**	.447**	.504**	.628**	.681**	.625**	.696**	.703**	.638**	.451**
Compatibility: X5	5.26	1.194					1	.844**	.499**	.670**	.656**	.648**	.714**	.590**	.598**	.696**	.518**
Complexity: X6	5.18	1.174						1	.507**	.587**	.667**	.689**	.645**	.670**	.663**	.682**	.573**
Trialability: X7	5.14	1.243							1	.605**	.586**	.565**	.602**	.455**	.459**	.518**	.446**
Information: X8	5.13	1.390								1	.751**	.620**	.784**	.436**	.490**	.560**	.425**
Transaction: X9	5.37	1.245									1	.742**	.803**	.654**	.651**	.616**	.426**
Customization: X10	5.51	1.188										1	.720**	.716**	.705**	.686**	.519**
Connection: X11	5.32	1.219											1	.638**	.633**	.703**	.496**
Financial: X12	5.66	1.133												1	.866**	.662**	.503**
Perspective: X13	5.55	1.132													1	.746**	.527**
Internal: X14	5.28	1.052														1	.682**
Growth: X15	5.46	1.035															1

**. Correlation is significant at the level of 0.01 (2-tailed).

4.1 ANALYSIS RESULTS OF THE STRUCTURAL EQUATION MODEL

The analysis result of the structural equation model (SEM) that was related to the identification of the manifest variables and latent variables by analyzing the reflective and formative scale, and verifying the goodness of fit measures indicated that the test result of the model fit was Chi-square (χ^2) = 71.572, df = 47, CMIN/DF (χ^2 /df) = 1.523, GFI = .974, CFI = .995, AGFI = .934, NFI = .987, RMR = .040, and RMSEA = .038. The model had a statistical significance at .05. Therefore, other statistics were considered, which comprised CMIN/DF = 1.523, GFI = .974, RMSEA = .038, and RMR = .040 which RMSEA < .05 (Table 4). Thus, it was concluded that the SEM of the variables had an impact on the performance of the retail ready-made garment business, and the e-business adoption in Thailand had a goodness of fit [57, 58, 61].

Table 4

Comparison of the goodness of fit

Relevant Statistics	Criteria	Test Value
Relative Chi-square	χ^2 /df < 3.00	1.523
Goodness of Fit Index	GFI > .90	.974
Comparative Fit Index	CFI > .95	.995
Normal Fit Index	NFI > .90	.987
Adjusted Goodness of Fit Index	AGFI > .90	.934
Standardized Root Mean square Residual	Standardized RMR < .05	.040
Root Mean Square Error of Approximation	RMSEA < .08	.038

Source: Researcher, 2024

From Table 5, the standard regression weight and squared multiple correlations (R^2) of the business performance were .703 - .837 and .434 - .994, respectively. The standard regression weight and squared multiple correlation (R^2) of the innovation characteristics were .553-.933 and .306 - .870, respectively. The standard regression weight and squared multiple correlation (R^2) of firm characteristics were .809 - .921 and .655 - .847, respectively. The standard regression weight and squared multiple correlation (R^2) of e-business adoption were .842 - .879 and .709 - .772, respectively.

Table 5*Analysis of the variables relationship to the structural equation model*

Variable Relationship	Standard Regression Weights	S.E.	R ²	C.R.	p
E business adoption <--- Innovation_characteristics	.747	.055	.697	12.583	***
E business adoption <--- Firm characteristics	.114	.053		2.123	.034
Business performance <--- Firm characteristics	.148	.045	.944	2.805	.005
Business performance <--- E_business adoption	.867	.054		13.899	***
Internal <--- Business performance	.837		.815		
Perspective <--- Business performance	.817	.052	.667	19.886	***
Growth <--- Business performance	.703	.054	.434	15.158	***
Financial <--- Business performance	.825	.059	.994	17.675	***
Trialability <--- Innovation characteristics	.553	.053	.306	11.794	***
Complexity <--- Innovation characteristics	.933		.870		
Compatibility <--- Innovation characteristics	.907	.033	.823	29.752	***
Relative <--- Innovation characteristics	.841	.037	.707	24.707	***
Top <--- Firm characteristics	.921		.847		
Benefits <--- Firm characteristics	.861	.046	.742	23.469	***
Firm size <--- Firm characteristics	.809	.042	.655	21.294	***
Information <--- E business adoption	.845	.065	.714	17.796	***
Transaction <--- E business adoption	.879	.051	.772	21.229	***
Customization <--- E business adoption	.856		.732		
Connection <--- E business adoption	.842	.050	.709	20.137	***

Note: Statistical significance *** p < .001.

Source: Researcher, 2024

From the analysis results, the equation was:

$$\text{Business Performance} = .15\text{Firm Characteristic} + .87\text{E-business adoption}, R^2 = .94. \quad (1)$$

From the equation, it was found that business performance had a positive impact from the firm characteristic and e-business with statistical significance, which the variance of the business performance was explained as 94%.

4.2 HYPOTHESIS TESTING RESULT

The hypothesis test considering the CR (t-Value) and p-Value, and the influence of each pair of variables indicated that all regression coefficients (coef.) of the relationship of each hypothesis showed a significance higher than 1.96. It could be concluded that the research results supported all hypotheses. The analysis results of the factor influence are shown in Table 6.

Hypothesis 1 (H1): Firm characteristics affect the business performance. The hypothesis test result showed that the regression coefficient was .148. This was true with the statistical significance.

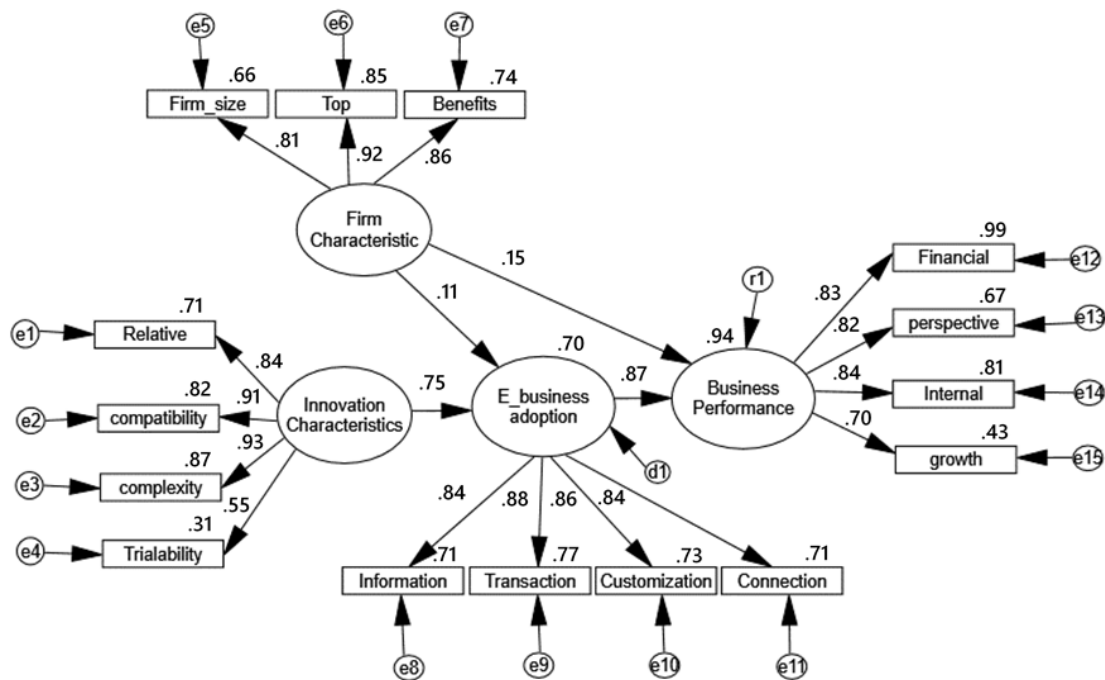
Hypothesis 2 (H2): Firm characteristics affect the e-business adoption. The hypothesis test result showed that the regression coefficient was .114. This was true with the statistical significance.

Hypothesis 3 (H3): Innovation characteristics affect the e-business adoption. The hypothesis test result showed that the regression coefficient was .747. This was true with the statistical significance.

Hypothesis 4 (H4): E-business adoption affects the business performance. The hypothesis test result showed that the regression coefficient was .867. This was true with the statistical significance.

Figure 3

Final model



Chi-square (χ^2) = 71.572, df = 47, CMIN/DF (χ^2 /df) = 1.523, GFI = .974, CFI = .995, AGFI = .934, NFI = .987, RMR = .040 and RMSEA = .038

Source: Researcher, 2024

Table 6*Hypothesis test results*

Hypothesis	coef.	t-test	TE	DE	IE	Results
H1: Business performance <---Firm characteristics	.148	2.805	.247	.148	.099	Supported
H2: E-business adoption<---Firm characteristics	.114	2.123	.114	.114	.000	Supported
H3: E-business adoption<---Innovation characteristics	.747	12.583	.747	.747	.000	Supported
H4: Business performance <---E-business adoption	.867	13.899	.867	.867	.000	Supported

Note: TE: Total effects; DE: Direct effects; IE: Indirect effects; Coefficient: coef.

Source: Researcher, 2024

4.3 DISCUSSION AND IMPLEMENTATION

The research on the structural equation model (SEM) of the variables affecting the business performance of the retail ready-made garment business by e-business adoption in Thailand showed that all hypotheses supported the research with statistical significance. It was found that e-business adoption affected the business performance the most, followed by the firm characteristics. This finding was consistent with Wu et al. [28] who examined the factors affecting business success in different businesses in terms of innovations, environment and identity creation in e-business adoption [27]. Moreover, the use of the Internet application of the business in communication and management was the diffusion of e-business [15] by using an electronic system to buy, sell or exchange products, services and information by means of an Internet network [35]. Similarly, Wu and Chuang [40] studied the diffusion of the electronic system in supply chain management that affected the efficiency of good organization, learning, network construction, and knowledge transfer [34]. However, the application of a balance scorecard (BSC) as the measuring tool was popular to use as the systematic tool for strategic planning [42]. This also conformed with Chang and Graham, [46] who discovered the relationship of technologies, innovations and efficiency of the firm in e-business adoption for the integration of the supply chain and evaluation [45, 47]. Nevertheless, the diffusion of innovation and information technology affected the efficiency of the measure and evaluation with the BSC [43] and the efficiency of the organization in using digital technology of e-business in production or service [48]. Therefore, in a firm where the top management supports information technology and innovation, the personnel and relevant division would perform their functions efficiently, as well as had knowledge and capability that would result in efficiency and effectiveness [28].

5 RESEARCH IMPLICATIONS

E-business plays an important role in national economic promotion, including cross-border commerce which creates an increasing value of online sales worldwide. As a result, this creates competitiveness for the industry applying technology to the business. Moreover, in a world that is being disrupted by technologies, without any adjustment or transformation, the business will not be able to grow. This disruption, thus, is an opportunity and destruction, which is a challenge for business. Therefore, the business should set the goal for sustainable development by adopting e-business as the key tool to drive the national economy. Furthermore, the use of big data or data analytics would upgrade business efficiency the same as the use of artificial intelligence (AI) that would support business operations, human resource management, and customer information management. Nevertheless, other factors affecting business growth are the use of various platforms, marketing strategies that access the customer widely, reliable services, adoption of technology to e-commerce, and skillful personnel in e-commerce, which would have sustainable positive impacts on the business operation. Due to the change in customers' behavior toward becoming online users, the government sector should set the policy and provide aid to promote the knowledge to the people for employment and careers from the online business that would maximize the value of e-business in Thailand.

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