

Identifying Factors influencing E-commerce Enterprises Outcomes in Ho Chi Minh City, Vietnam: A Technology–organization–environment Framework Approach

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Abstract. Competitive capability is a crucial factor for the success of a nation, industry, and company. It encompasses the institutional framework, policies, and influences on productivity, market share, and profitability. To survive and thrive, enterprises need to maintain high performance in today's business environment, influenced by infrastructure, legal, and financial factors. Enhancing operational efficiency and competitiveness in e-commerce in Vietnam, especially in big cities like Ho Chi Minh City, is becoming an urgent issue. Therefore, researching the impact of Technological, Organizational Competitive Capability, and the Business Environment on Business Results Research Model, specifically focusing on E-commerce enterprises in Ho Chi Minh City, is of paramount importance. The objective of this study is to review the theoretical foundations and relevant research concerning the research issue and ascertain the relationships between the components of competitive capability of e-commerce enterprises and intermediate factors. The study involves surveys and expert interviews targeting directors, deputy directors and authorized individuals involved in the leadership, management, and operation of enterprises. These individuals possess experience and understanding of the business situation of e-commerce enterprises and electronic trading businesses. The research results propose a model examining the relationships within the TOE theoretical framework (technology capability, organizational capability, and business environment) concerning competitive capability and business outcomes of e-commerce enterprises in Ho Chi Minh City.

Keywords: Enterprise competitive capability, technological competitive capability, organizational competitive capability, structural equation modeling, e-commerce enterprises in Ho Chi Minh City.

1. Introduction

Competitive capability is a fundamental factor when evaluating the success of a country, sector, or company. It encompasses the structural foundations, policies, and factors that influence efficiency, market share, profitability, and business steadiness. In today's dynamic and competitive business landscape, it is crucial for businesses to establish and maintain exceptional performance to survive and thrive. The achievement of competitiveness is contingent upon both enterprise conduct and the external business milieu, encompassing aspects such as infrastructure, legal frameworks, and financial efficiency. The improvement of operational efficiency and competitive capacity within Vietnam's e-commerce domain, especially in major urban centers like Ho Chi Minh City, is an urgent matter. The forces of globalization and trade liberalization have notably affected the global economic landscape, propelling multinational corporations to expand their operations and augment their impact. The e-commerce sector is experiencing rapid growth, characterized by an upsurge in purchasing power and considerable potential for development. However, various challenges and constraints persist in technology, infrastructure, and workforce, particularly for service-oriented enterprises.

Studies on e-commerce are also conducted with multi-dimensional analysis of activities and related aspects, especially aspects under the Technology - Organization - Environment (TOE) framework such as Xie (2012), Sila (2013), Awa (2015), Kumar (2016). However, the application of the TOE framework in researching the competitive capability of e-commerce enterprises in Vietnam is still limited. Currently, no author has studied this issue in depth. Some studies on competitive capability such as the article of Nguyen Dinh Duong (2012), Tran Thi Thanh Tam (2016), Truong Thu Huong and Do Van Chuc (2021) also revolve around small and medium enterprises; there is still no research article with research subjects and target respondents related to e-commerce businesses. The above gaps are the reason why the authors carried out this research to identify factors and research models of factors affecting the competitive capability and business results of e-commerce enterprises. This paper has the following main contents: (1) A brief review of the theoretical basis and research related to the research problem. (2) Determine the relationship between the factors of competitive capability and with the intermediate components to form the research model and (3) Design the research process.

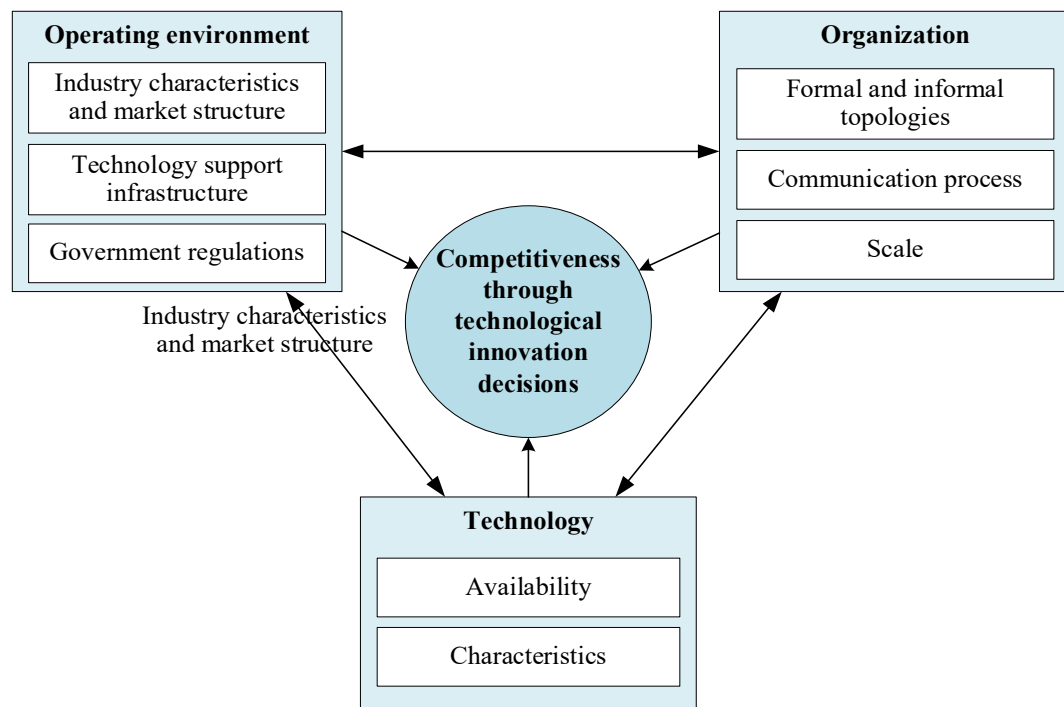
This research addresses the limitations of previous studies by: (1) The authors showed a particular interest in the human factor and incorporated this factor when applying the TOE framework in this study. (2) In addition to utilizing the TOE theoretical framework to investigate the competitive capability of enterprises, the authors also applied the TOE framework to assess both the competitive capability and business outcomes of e-commerce enterprises.

2. Theoretical Basis and Literature Review

2.1. Theoretical Basis

The theoretical basis of this article is related to the topics: competition and competitive capability, E-commerce, Technology - Organization - Environment framework and business results. And some background theories that the paper uses include: The competitive capability theory from Porter (2008) and the resources based competitive capability theory.

According to Ford and Håkansson (2013), Tsai and Yang (2013), Medlin et al. (2015), competition is an intrinsic factor of the market; it helps businesses gain relative advantages in terms of costs, profits and avoid the risks involved. Besides, competitive capability is the ability to create, maintain, use and create new competitive advantages of an enterprise to create higher productivity and quality than competitors, occupy a large market share and generate high income and sustainable development (Cetindamar and Kilitcioglu, 2013; Bhawsar and Chattopadhyay, 2015).



(Source: Tornatzky and Fleischer, 1990)

Fig.1: Technology – Organization – Environment Framework

Similarly, e-commerce involves the use of electronic means and the internet for the successful transaction of goods and services. E-commerce comes from doing business on an online platform with a large number of users (Turban et al., 2017). Also related to e-commerce, the TOE (Technology - Organization - Environment) framework was first formed in 1990 by Tornatzky and Fleischer. The TOE framework assumes a set of factors to predict e-commerce applicability as shown in Figure 1. In the framework of this article, in terms of business results, the author will focus mainly on the most popular indicators of operating results and financial results of e-commerce enterprises.

The research presented in this paper is also related to the competitive capability theory of Porter (2008). At the enterprise level, competitive capability is correlated with business strategy, technology, management and innovation. Besides, the theory of competitive capability is based on four perspectives that are based on resources, knowledge, capabilities and institutions.

2.2. Literature Review

The relationship between technological capability and competitive capability

According to Guan (2006), technological innovation is a necessary trend and businesses today tend to normalize this in the process of improving their competitive capability. Almeida (2007) stated that businesses with low levels of dynamism in learning technology and techniques will lead to limited ability to innovate and develop new products. Technological learning and technological innovation are identified by Teo (2009) as two important factors that directly affect the technological capability of an organization. Tran Thi Anh Thu (2012) identified factors affecting the Group's ability to enhance competitive capability, including equipment and technology factors, production and business activities, research, and development activities. Finally, Hu (2022) proposes that the factors of e-commerce and competitive capability related to technological capabilities are technological innovation.

The relationship between organizational capability and competitive capability

Tung (2003) has identified the factors affecting human resources in e-commerce enterprises as infrastructure and investment ability. Nguyen Huu Thang (2008) has affirmed that the organizational

model of the enterprise and the capability of managers are the two leading factors affecting the competitive capability of enterprises. Tran Thi Anh Thu (2012) has believed that human resources and marketing activities have a positive impact on the competitive capability of enterprises. Modeling internal factors affecting the competitive capability of private enterprises in Can Tho city, author Huynh Thanh Nha and La Hong Lien (2015) confirm the management capability of the leadership team and the quality of the business. The higher the number of human resources will contribute to improving the competitive capability of enterprises.

Nguyen Van Dat (2016) studies the factors affecting the competitive capability of coffee businesses in Dak Lak province. The author has approached the competitive capability of enterprises based on the factors of resources, capability, value chain and market orientation. Munizu et al (2021) proposed a model for developing creative industry competitive capability in Indonesia; Minizu's model affirms that the enterprise resource factor and the enterprise's ability are the two factors that have the greatest influence on the competitive capability of enterprises in this industry. The research of Hu (2022) mentioned above also concluded that factors such as organizational structure, human resources, enterprise resources, operating costs, capital, and service level are correlated with the capability of e-commerce enterprises.

The relationship between business environment and competitive capability

Heeks (2006) argues that the business environment related to market share, government policies and governance has a great impact on the competitive capability of enterprises. Research by Heeks (2006) shows that the impact is organic; e-commerce development will bring benefits to businesses and vice versa, if businesses develop well e-commerce and good government policies, it will have an impact on making e-commerce grow. Research by Nguyen Huu Thang (2008) shows that the current situation of Vietnam's business environment is also affected by a number of basic factors, which are policies, government management and the market. Tran Thi Anh Thu (2012) said that factors related to the business environment such as guidelines and policies of the communist party and state; the legal environment will affect the competitive capability of enterprises. Bach Ngoc Hoang Anh (2018) identifies quality management, market orientation and service environment as components of competitive capability in affecting business performance. Hu (2022) argues that the factors related to the business environment that affect competitive capability are state regulations and laws (policies), market demand and customer satisfaction.

The relationship between technological capability, organizational capability, competitive capability, and business results

Regarding the relationship between technological capability and organizational capability, Kumar (2016) applied the TOE theoretical framework to propose factors affecting the competitive capability of e-commerce enterprises in Singapore. This author asserts that technological innovation is a "survival" factor for businesses. Similarly, Li and Xie (2012) apply the TOE theoretical framework and suggest that businesses should synchronize development solutions, improve the quality of digital human resources associated with innovation, technology application. Regarding the relationship between organizational capability and business environment, Zhu (2004) presented a view on value creation of e-commerce business based on competitive capability including factors such as: technology availability, financial resources, business size, corporate structure, internal resources. Besides, Awa (2015) applies and integrates the theories of Technology Acceptance Model - TAM, Theory of Planned Behavior - TPB and TOE model; the author has confirmed that the organizational composition includes factors such as: enterprise size, organizational vision, operating conditions, differentiation; Environmental components include the following factors: the level of consumer readiness, competitive pressure, the willingness of trading partners. Sila (2013) said that the size, type of business, and management level all affect the competitive capability of e-commerce enterprises in different countries.

Regarding the relationship between technological capability and business environment, in the

research of Kumar (2016) and Li and Xie (2012) above mentioned the relationship between technological capability and organizational capability. The authors have also discovered that technological capabilities influence and interact with the business environment. The literature review on factors of competitive capability and business results is summarized in Tables 1 and Table 2 below by the authors.

Table 1. The components of technological capabilities, organizational capabilities, and the business environment literature review.

No.	Research	Technology Capability		Organizational Capability				Business environment		
		Technological innovation	Technology learning	Manager qualifications	Organizational capability	Organization business model	Human resources	Government policy	Business market	Government management
		X1	X2	X3	X4	X5	X6	X7	X8	X9
1	Guan (2006)	x	x							
2	Almeida (2007)		x							
3	Teo (2009)	x	x							
4	Jackson (2003)						x			
5	Sanchez and Heence (2004)				x					
6	Huu Thang (2008)					x	x			
7	Thanh Nha and Hong Lien (2015)			x			x			
8	Van Dat (2016)				x					
9	Munizu (2021)				x					
10	Hoang Anh (2018)								x	
11	Zhu (2004)				x	x		x	x	
12	Awa (2015)					x			x	
13	Kumar (2016)	x			x		x			
14	Sila (2013)			x		x			x	
15	Li and Xie (2012)		x	x						

(Source: Compiled by author, 2023)

Table 2. Competitiveness and business results literature review

No	Authors	Competitiveness			Business results			
		Technology capability	Organizational capability	Business environment	Operational performance	Financial performance	Supply chain performance	Marketing performance
		X10	X11	X12	X13	X14	X15	X16
1	Heeks (2006)			x				
2	Almeida (2007)	x						
3	Munizu (2021)		x					
4	Devaraj (2007)				x			
5	Flynn (2010)					x	x	
6	Hubbard and Beamish (2011)							x
7	Huo (2014)						x	
8	Yu (2021)					x		
9	Anh Thu (2012)	x	x	x				
10	Nguyen Huu Thang (2008)		x	x				
11	Tung (2003)		x	x				
12	Porter (2008)			x				
13	Hu (2022)	x	x	x				

(Source: Compiled by the author, 2023)

Based on the results of the literature review in Table 1 and Table 2, some conclusions have been drawn out. Technological capability factor is measured by two activities of enterprises, including: Technological innovation (X1) and Technological learning (X2). Similarly, the organizational capability factor is measured by four activities of the enterprise, including: Manager qualifications (X3), Organizational capability (X4), Organizational business model (X5) and Human resources (X6). Similarly, the business environment factor is measured by two activities of enterprises, including: Government policies (X7) and Market (X8). Although it does not receive research attention, the content Government management (X9) will also be proposed by the author as a component of the business environment.

The contents of measuring business results, including: X13 – Operational performance, demonstrating capabilities in terms of quality, cost, delivery, and flexibility. X14 – Financial performance, expressed through indicators such as ROI, income (revenue structure), asset utilization performance (asset turnover) and optimal cost reduction. X15 – Supply chain performance and the final component is X16 – Marketing performance, demonstrating the company's capabilities in terms of sales, market growth and market share.

Based on the results of the literature review, the author finds that the application of the TOE framework in studying the competitive capability of e-commerce enterprises in Vietnam is still limited; almost no author is interested in this issue; especially in the context of e-commerce growing strongly. Besides, human resources and the strategy of combining resources are the core factors forming the competitive capability of e-commerce enterprises. However, in previous studies on the topic of applying TOE framework in e-commerce enterprises, this group of factors was not mentioned in the research model; In this study, the author will add the Human resource factor when applying the TOE framework to the research. Finally, there are very few previous studies on the correlation between competitive capability, e-commerce, and business performance; and the TOE model is often used only to assess the competitive capability of e-commerce enterprises, not meeting the objective of assessing both

competitive capability and business results at the same time. The above issues are also considered as research gaps and will be focused on solving in this paper.

3. Research Methodology

The research process is designed through three phases, 12 steps as summarized in Figure 2.

The first step, the research problem is defined as “*The influence of technological, organizational competitive capability and business environment on business results research model: The case of e-commerce enterprises in Ho Chi Minh City*”. This problem is presented through the process of analyzing the need for research in addition to contents such as objectives, questions, research objects and scope, research methods, research meaning and research outline. The content of this step also includes a review of background theory, related theory, practice, and previous studies review on competitive capability in terms of technology capability, organizational capability, business environment and business results as well as the binding relationships between these components. The results of this step will identify gaps that need to be improved along with the research model.

The first and second steps refer to the formation of a scale that recognizes the relationship between technological capability, organizational capability, business environment and business results. Next, research conducts a preliminary survey using a questionnaire and then proceed to step three, using Cronbach's Alpha coefficient to assess the reliability of the preliminary scale.

The fourth step describes the process of factor analysis to discover EFA to reconstruct the preliminary scale and form the official scale. The fifth step, of the preliminary research phase (with a combination of qualitative and quantitative methods), in which the main technique is to interview experts. These experts are defined as those who have experience in management, have in-depth knowledge of the research problem, understand the research model proposed in the third step, and understand how to build research scale.

The formal research phase consisting of steps 6, 7, 8, 9, and 10 is planned to carry out the formal research (using quantitative methods. Along with that, the data is analyzed using techniques such as: Cronbach's Alpha analysis, EFA analysis, CFA analysis, SEM analysis, Bootstrap test and multigroup analysis, finally, the conclusions about the research problem as a basis for proposing managerial implications.

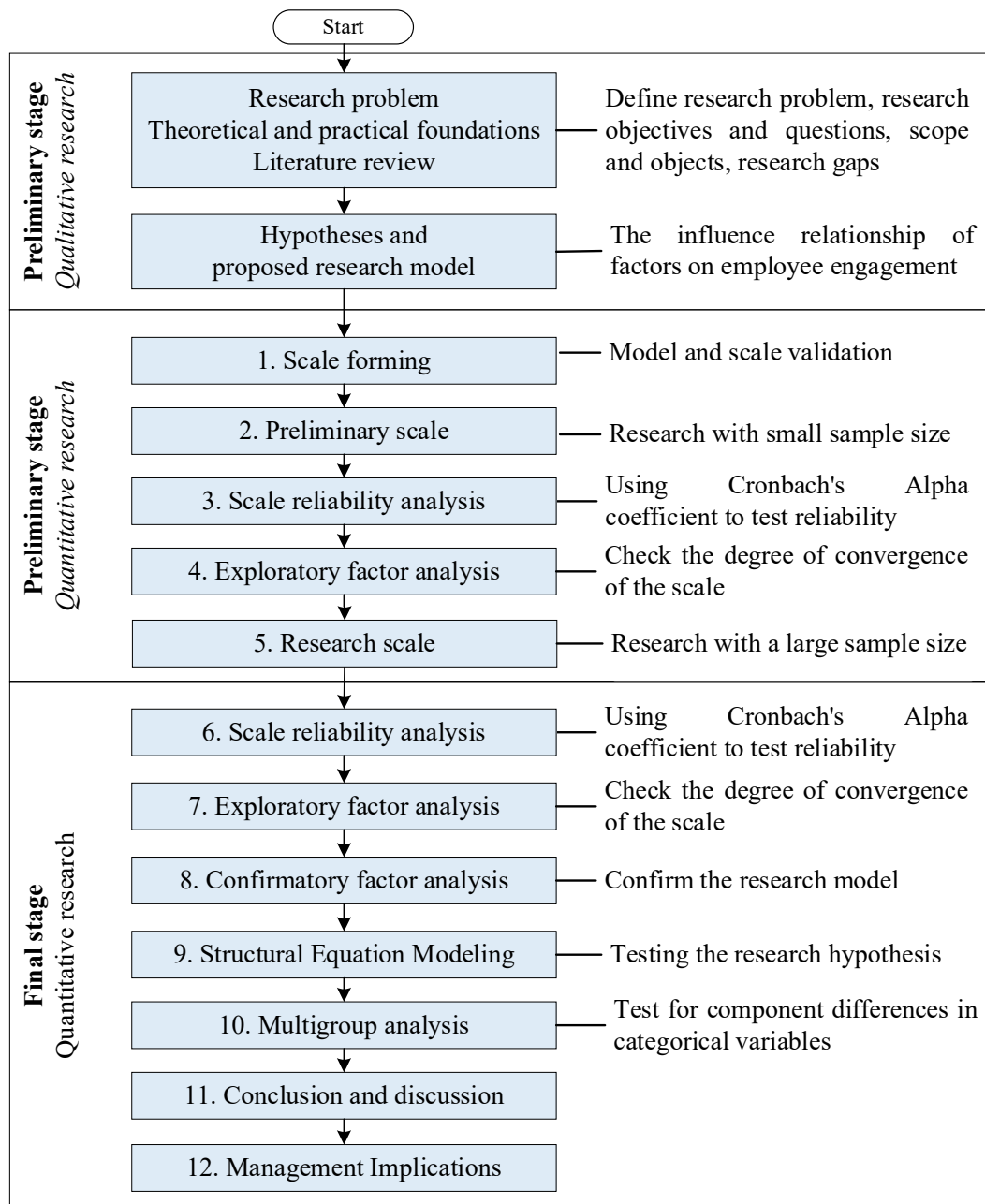


Fig.2: Research process (Source: Suggested by the author, 2023)

4. Research result

Based on the research gap and the background theory, the author proposes the following research hypotheses. The first is the hypothesis about the relationship between technological capability and competitive capability, through the researches of Tran Thi Anh Thu (2012), Awa (2015), Kumar (2016), Nguyen Van Dat (2016) and Hu (2022), the author found that the higher the technological capability of a business, the more likely it is that they will accept new technologies quickly and smoothly; This leads to the hypothesis:

➤ *Hypothesis H1: Technology capability has a positive impact on the competitive capability of e-commerce enterprises in HCMC.*

As for the relationship between organizational capability and competitive capability; based on the studies of Tran Thi Anh Thu (2012), Li and Xie (2012), Sila (2013), Nguyen Van Thuy (2015), Munizu et al (2021), the author found that businesses applying innovation strategies will be able to create

competitive capability in e-commerce because of the benefits of leading technology and the ability to accept high levels of risk; therefore, the author proposes the following hypothesis related to organizational capability:

➤ *Hypothesis H2: Organizational capability has a positive impact on the competitive capability of e-commerce enterprises in HCMC.*

As for the relationship between competitive capability and business results, technological capability, organizational capability and the elements constituting the business environment have a great impact on business results. Each competency has its own characteristics such as unique, valuable, irreplaceable and inimitable properties that can lead to exceptional performance. This has been confirmed in the research of many authors, such as: Nguyen Huu Thang (2008), Flynn (2010), Hubbard and Beamish (2011), Huo (2014), Yu (2021); The author proposes the following hypothesis:

➤ *Hypothesis H3: Competitiveness has a positive impact on business results of e-commerce enterprises in HCMC.*

In the study of the relationship between technological capability and organizational capability, Zhu (2004), Sila (2013), Tung (2003) and Nguyen Van Dat (2016) affirmed that the implementation of technological and organizational innovation is very necessary; from that, the author proposes the following related hypothesis.

➤ *Hypothesis H4a: Technology capability has a positive impact on organizational capability of e-commerce enterprises in HCMC.*

➤ *Hypothesis H4b: Organizational capability has a positive impact on the technological capability of e-commerce enterprises in HCMC.*

The business environment governs many activities of enterprises from operating strategies to the constraints that businesses must comply with related to policies. For the business environment component, competition in the industry, pressure from trading partners, production or competition of competitors in the market that enterprises choose to enter have been mentioned by Awa et al. (2015), Kumar et al. (2016), Sila (2013), Tung (2003), Nguyen Huu Thang (2008) in their research. Besides, the socio-cultural environment, the political institutional environment related to the policies and the management and administration of the government have been analyzed by Li and Xie (2012), Tung (2003), Nguyen Huu Thang (2008) and Porter (2008) in their research. However, the study of this paper was conducted in Ho Chi Minh City, so the impact of business environment for each object will be the same. Therefore, the hypothesis related to the relationship between business environment and technological capability and organizational capability is only proposed in terms of the moderator variable as follows:

➤ *Hypothesis H5a: The business environment has a moderating effect on the relationship between technological capability and competitive capability of e-commerce enterprises in HCMC.*

➤ *Hypothesis H5b: The business environment has a moderating effect on the relationship between organizational capability and competitive capability of e-commerce enterprises in Ho Chi Minh City.*

Based on the above hypotheses and the presented analyses, the proposed research model is shown in Figure 2 as follows.

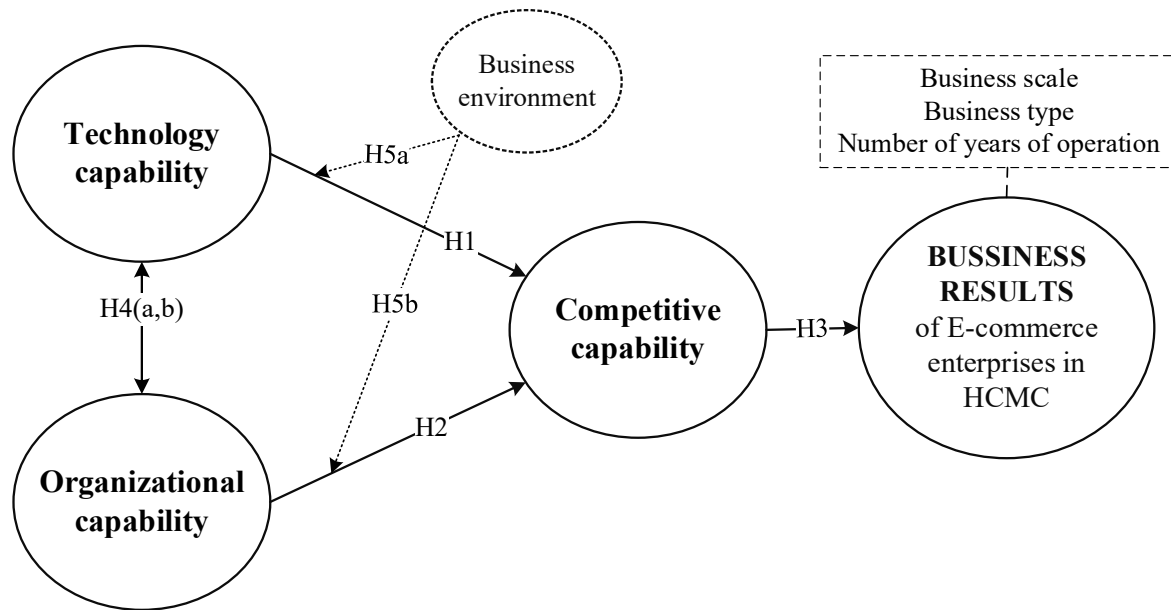


Fig.3: Proposed Research Model (Source: Proposed by author, 2023)

5. Conclusions

With the aim of synthesizing the theoretical framework and reviewing relevant literature concerning the competitive capability, this comprehensive study has culminated in proposing a research model to elucidate the influence of competitive capability on business outcomes in the context of e-commerce enterprises. *Firstly*, this study synthesized theories from a compendium of prior research to establish the foundational underpinning for the topic. These included theories related to competition, competitive capability, the theoretical foundations of e-commerce, and the application of e-commerce by both domestic and international enterprises. Notably, the TOE theoretical framework will serve as the foundation for developing the research model for the dissertation, as well as the theoretical framework for measuring business outcomes. *Secondly*, this study conducted a literature review of relevant research to discern the relationships of each individual aspect within the multidimensional TOE framework (technological capability, organizational capability, business environment) with overall competitive capability. Additionally, it investigated the relationship between competitive capability and the business outcomes of enterprises, as well as the interdependencies among the components within the TOE theoretical framework. *Lastly*, based on the presented theories, the authors identified hypotheses and formulated a research model to study the relationships within the TOE theoretical framework (encompassing technological capability, organizational capability, and business environment) concerning competitive capability and business outcomes of e-commerce enterprises within Ho Chi Minh City.

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