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Strategic Agility: Environmental Turbulence and Cloud Computing Capacity of Government and Non-Government Sectors in Thailand

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ABSTRACT

This study investigates the influence of environmental turbulence and cloud computing capacity on the strategic agility of various firms, distinguishing between government and non-government entities. Predicated on the framework of dynamic capabilities and contingency theory principles, it explores the correlations between environmental turbulence, cloud computing capacity, and strategic agility. The study draws upon data from 366 e-Commerce businesses in Thailand, comprising 213 government and 153 non-government organizations. Regression analysis is utilized to evaluate variables about the validity and reliability, and to test hypotheses. The findings indicate that cloud computing integration significantly impacts all models, whereas cloud computing flexibility affects only models 1 and 2, and market turbulence only impacts model 1. Technological turbulence shows no significant effect on any model. The study suggests that corporations should prioritize enhancing their cloud computing capabilities to foster strategic agility and fulfill their strategic objectives. The study further recommends expanding the scope of future research to diverse sectors or geographical regions, to verify the applicability of these findings across a broader business spectrum.

Keywords: Strategic Agility, Environmental Turbulence, Cloud Computing Capacity.

Introduction

The proliferation of innovative technology presents significant complexities for organizations in reshaping their conventional business models and cultivating strategic competencies, thereby enabling them to create the firm values, strategies, and structure mechanisms (Feroz, Zo, & Chiravuri, 2021). Modern information technology, especially the digital transformation is so powerful to converts human's lifestyles into a computer-simulated environment. This becomes the digital civilization or future digital society (Rascão, 2021). The huge growth of the digital civilization or future digital society is the increase of advanced technology influence firms to merge digital literacy. This can be an element of business digitalization or electronic commerce (e-Commerce). This phenomenon is referred to as the burgeoning digital economy in the corporate realm, and the substantial potential inherent in e-Commerce has inspired a multitude of businesses, subsequently driving economic growth in various nations (Xi et al., 2023).

The e-Commerce initiatives are critical for several firms in different regions to connect between people and firms. The effect of COVID-19, people have massive demands stimulate to e-Commerce, and firms need to foster the capabilities to serve better for their customers and the connectivity between people (Lin et al., 2020). In this case, Thailand is an example of an area about e-Commerce business that is a prosperous

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these days. The exponential growth of e-Commerce in Thailand was substantiated. The 2020 report from a Department of Business Development stated that revenues amounting to 20,000 million baht and an increment to 10,000 e-Commerce enterprises (Department of Business Development, 2022). Internet user penetration in 2020 approached nearly 70 percent of the Thai population, representing approximately 47.5 million users. This proliferation of digital connectivity has facilitated the entry of new competitors into e-Marketplaces (Electronic Transactions Development Agency, 2021), thereby intensifying the pace of business activities aimed at attracting superior customers. Such digital platforms have propelled businesses to expand their geographical footprint globally, leveraging information technology to establish connections with a vast customer base (Irfan, Wang, & Akhtar, 2019). Simultaneously, the advent of such business opportunities has also unlocked doors for competitors to infiltrate and potentially contribute to the intensification of competitive dynamics in the e-Commerce arena.

The prosperous era of an adoption of new technologies or digital transformation evolves their strategies, management practices and major activities for firms. Such a shift urges strategic providers and policymakers to recommend businesses foster firm strategic agility, which could potentially disrupt firms (Dyk & Belle, 2019). Early 1990 manufacturing firms are fronting turbulence environment, more complexity, and dynamic. This is to maintain firms' long-term competitiveness, a key successful for manufacturing firms, with a primary focus on manufacturers swiftly responding to market changes and to achieve firm agility (Richardt, Emmerich, & Salomo, 2021). Several facets of firms' agility have since garnered attention from practitioners and policymakers across disciplines, encompassing production processes, marketing, and human resources (Doz, 2020).

Firm agility represents a spectrum of capabilities realized through the rapid reallocation of resources within and across firms to proficiently manage unpredictable factors. These significant changes can engender business opportunities for growth and performance enhancement. Furthermore, firm performance is influenced by agile attributes, capabilities, enablers, and improvement paths, all of which align with firm strategic agility (Nejatian et al., 2018). In relation to Udchachone's (2000) findings, it becomes clear that customer perceptions and experiences hinge significantly on technological development. Consumers tend to prefer services that are convenient and user-friendly, underlining the importance of integrating such elements into strategic agility. This means that as firms respond swiftly to changing markets and customer needs, a key consideration should be the effective use of technological advancements like cloud computing to ensure customer experiences and perceptions are positive. Thus, strategic agility, enabled by technological development, can contribute to both customer satisfaction and firm performance.

E-Commerce, as influenced by innovative technology, presents significant challenges to businesses grappling with environmental instability. This instability encompasses heightened competition, fluctuating customer demands, and unpredictable business environments. Nowadays, cloud computing is a usage of data processing security. Cloud computing is one of the most innovative information technologies. It provides more efficiency and effectiveness for big data (Andavan & Vairaperumal, 2023). This powerful tool aids firms in overcoming the inherent limitations of traditional IT designs, notably their inflexibility and lack of integration in their software and hardware architectures.

The current research trend considers abundant of development using technology to increase significant innovation for firms to generate risk and link to the firm's configuration of the best decision making (Ali, Warren, & Mathiassen, 2017). Firm culture can foster strategic agility regarding an ambiguous situation. Since Chakravarty, Grewal, & Sambamurthy, (2013) found that firms have focused on agility as a strategic capability and reasons of an expectation of technology transformation to be a significant element to develop the firm agility. However, if researchers commonly ignore variables that may affect

organizational agility, one of them is organizational culture (Gagel, 2017). Firm agility can be a flexibility, responsiveness, expertise, role, technological competency, and capacity to enhance firm performance. Therefore, this study uses the concept of contingency theory to recognize the characteristics of firm's agility and environmental turbulence alignments, including cloud computing capacity. Also, the concept of dynamic capability is to develop firm strategic agility, which implies that the dynamic capability of the firm to quickly allocate resources in environmental turbulence conditions and cloud computing capacity to achieve the firm's performance.

Objectives of the Study

The key study question is in what way environmental turbulence and cloud computing capacity influence the firms' strategic agility (government versus non-government).

The objective of this study is to investigate the affiliation and comparison of environmental turbulence, cloud computing capacity, and strategic agility in government and non-government firms. Thus, the specific objectives are:

First, investigate the affiliation between two elements of environmental turbulences such as (1) technological turbulence and (2) market turbulence, and four elements of strategic agility such as (1) operational agility, (2) customer alertness agility, (3) competitor awareness agility, and (4) strategic business relationship agility.

Second, determine the relationship between two determinants of cloud computing capacity, which are flexibility and integration in cloud computing and strategic agility.

Literature Review

Strategic Agility

The agile emergence was familiarized before the 1980s, when the Toyota Motor Company applied the combination of speed and flexibility in the manufacturing of their 30 Toyota plants worldwide. Toyota rapidly built a car and offered the freshest models to customers, while American carmakers such as Ford or General Motors could not provide the same organizational capabilities or flexibility in offering the same choice (Abdelilah, El Korchi, & Balambo, 2018; Denning, 2019). After that, Lehigh University presented the official report as "The Strategic of Manufacturing Firms in the 21st Century: The Viewpoint of Industrial Specialists," and the concept of an agile institute was introduced as an essential feature to deal with environmental dynamics with responsibility and flexibility (Dove, 1991).

Strategic agility was expanded to apply in academic research because agility provides firms with capabilities to deal with the dynamic of environments and markets (Gunsberg et al., 2018).

However, Sambamurthy, Bharadwaj, and Grover (2003) describe agility as the organizational ability to reach opportunities and seize those competitive market opportunities, and it is composed of operational agility, customer agility, and partnering agility. Thereafter, the agility research has narrowed down agility to the business stream or academic discipline such as supply chain agility, which applies agile capabilities to get ahead of competition in any uncertain situation. Then strategic agility plays a significant role in achieving competitive advantage in supply chain corporations (Ahmed et al., 2019). The most significant factor, which is every academic scholar's concern, is agile drivers, which reflect pressures and fluctuations such as dynamic competitive pressures. Organizations need to be agile in operating their own administration to sustain competitive advantage or achieve organizational goals (Tallon et al., 2019).

Various businesses applied strategic agility to their contexts, and the most common business context is the supply chain business, which needs to rapidly respond to changes in market and customer demand (Mandal, 2019). Moreover, major agility research has a dominant interest in technology in terms of how firms invest in

building technology capability or how firms can shape their use of human resources to gain organizational agility (Queiroz et al., 2018). Thus, this study sheds light on the context of firms, where there is still a lack of research on this business context, especially in an emerging country like Thailand. This study also sheds light on agility in technology research by focusing on the value creation potential of cloud computing capability, which is a new advanced technology that has just occurred in most subscript-based economies.

This study defines strategic agility as a multi-dimensional agility of sense changes and respond to unpredictability. The rapidly allocates resources from inside and outside of the firms to reach firm goal targets (Boonlua et al., 2022; Bakarada & Koronios, 2018; Nurcholis, 2019; Teece, Peteraf, & Leih, 2016). Although researchers conceptualized dimensions of strategic agility from different theoretical perspectives, they all indicate some ways to improve the effectiveness and efficiency of agility in the operation, capture market opportunities, keep an eye on key competitors, and utilize business relationships with all stakeholders (Tallon et al., 2019). Also, e-Commerce utilizes agile capabilities for business management that are valuable and heterogeneous, which can provide goal accomplishment and continue competitive advantage (Irfan, Wang, & Akhtar, 2019). Thus, this study comes with four elements of strategic agility by assemble previous agility researches under the dynamic capability concept. There are four elements such as (1) operational agility, (2) customer alertness agility, (3) competitor awareness agility, and (4) strategic business relationship agility.

Theoretical Foundations

Based on research that has already been done about firm agility, this study uses the perspectives concept of dynamic capabilities and contingency theory to find the characteristics and affiliation between the factors that affect environmental turbulence, cloud computing capacity, and strategic agility. These notions can be expected to explain and investigate variables and analyze the affiliation which is related to the objectives of this study.

Dynamic Capabilities

Based on research that has already been done about firm agility, this study employs the viewpoints from dynamic capabilities to find the characteristics and affiliation between factors or elements that affect environmental turbulence, cloud computing capacity, and strategic agility.

Dynamic capabilities were defined as a firm's ability to integrate, establish, and construct internal and external expertise to rapidly change the environment (Teece, Pisano, & Shuen, 1997). Firms that provide dynamic capabilities can achieve ultimate competitive advantages in challenging business environments (Teece, 2019). Firms were reminded that they should understand tangible and intangible sources of unstable over time through to respond to market dynamic. This concept can improve firm capability to generate sustained competitive advantage. Therefore, many firms can develop potential capabilities in rapid changes and unpredicted environment to integrate, construct, and reconfigure their capabilities or even in a stable environment (Handoko & Tjaturpriono, 2023). This can be concluded that dynamic capabilities can enable firms to transform themselves to develop capacities and capabilities to move beyond competitors to gain the competitive advantage.

Teece (2007) demonstrated that there are three elements: (1) sensing capability, which was made up of firm processes and people's abilities that were used to find opportunities; (2) seizing capability, which was made up of choice and decision-making protocols for business models, product designs, and employee loyalty; and (3) reconfiguration capability, which combined and changed resources and structures to keep growth going in the face of changes and a dynamic environment.

The dynamic capabilities are complicated depending on how quickly firms build new firm resources for

market dynamism and changes. This implies that dynamic capabilities suit an agile framework. Because agility includes dynamic capabilities like sensing, seizing, and reconfiguring by the firm's operation through aligning resources, the daily activity of core competency production to positively respond to strategic market demands, and the necessary processes of the firm's activities (Srivastava & Mir, 2020).

Consequently, this study constructs its conceptual framework drawing upon the perspective of dynamic capabilities. It underscores strategic agility within organizations as the pivotal dynamic capability for proficiently managing environmental uncertainty (Mandal, 2019). This strategic agility paves the way for the achievement of the study's objectives among operational agility, customer alertness agility, competitor awareness agility, and strategic business relationships. Notably, these aspects are positively impacted by environmental turbulence and the capacity of cloud computing.

Contingency Theory

Contingency theory, emerging from researchers who noted that the structure and functions of firms are contingent upon their interaction between internal and external indicators of firm's performance (Srivastava & Mir, 2020). The executive sovereignty is greater in turbulent environments than in static ones (Dill, 1958). Moreover, Lawrence & Lorsch (1967) found a correlation between the formality of a firm's structure and effectiveness. The Rumelt's (1991) research has confirmed that the contingency theory can strengthen firms from a strategic business unit up to a corporate level.

The contingency approach to examine how effect and implement effectiveness between several factors such as strategic planning, marketing, organizing, values, technology, and firm behaviors (Chen, 2021). It is predicated on the understanding that the efficacy of implemented strategies hinges significantly on the harmony among internal resource, strategy, external and internal environment, and the contexts of contingency theory. Importantly, contingency theory argues that there is no universally best approach to operating firms, with the optimal path being contingent on the unique internal and external situations firms encounter (McAdam, Miller, & McSorley, 2019).

Contingency theory further elucidates that appropriate firm structure and management styles depend on contingency factors, with firms needing to consider their situational context and surrounding environment when shaping their structure (Darvishmotevali, Altinay, & Köseoglu, 2020). This theory presents firms as open systems where information exchange occurs through an input-process-output procedure, necessitating the development of a unique set of contingency variables and processes. In rapidly evolving business environments, this process is seen as continuous (McAdam, Miller, & McSorley, 2019).

Turbulent business environments, characterized by digital disruptions and fluctuating customer demand, pose risks that necessitate the development of dynamic capabilities for maintaining a competitive advantage (Teece, 2018). Strategic agility, a key dynamic capability, is invaluable in environmental turbulence; organizational effectiveness is achieved by aligning firm characteristics with contingencies. Contingency theory thus facilitates predictions of firms' effectiveness based on strategic agility, environmental turbulence, and other related factors (Grotsch, Blome, & Sclerper, 2013). Therefore, in this study, contingency theory serves to elucidate the connections among strategic agility, environmental turbulence, and cloud computing capacity.

Environmental Turbulence

A turbulent environment was explained as rapid change and uncertainty that happen in the external environment of the firms (Abidemi et al., 2020). A turbulent environment consists of changes in technology, customers' needs, product and service trends, and business creations. The changes that arise in the environment can create new opportunities and threats for firms and competitors. Thus, the firms

must react suddenly to gain competitive advantages against competitors. Turbulence refers to uncertainty or hardly forecasting environmental surroundings, and environmental turbulence is defined as the rate and instability of the environment, which is the result of changes in customer preference, the development of new products, new technology, or the competition (Coreynen et al., 2020; Ashrafi et al., 2019). A turbulent environment increases both an organization's external linkages and the rate of change in those linkages (Haleblian & Finkelstein, 1993).

Turbulent environments have been recognized as the most significant feature of businesses, and thus, it is overbearing for firms to continuously scan the external environment with respect to changes in market, technology, and product or service (Kumar & Andotra, 2021). Calantone, Gacia, & Droge (2003) suggested that a high level of turbulence in the market, especially in the market, means that rapid changes in the market and customer needs can lead excellent challenges for firms executing effective product strategies and achieving the right position. Blielmel, Mccarthy, and Maine (2014) state that firms are aware of the changing market demands and customer needs. Thus, a quick response is preferred to feedback. The turbulence will make firms feel the need for new ventures to have a greater ability to allocate resources efficiently and use them flexibly. Therefore, the firms will introduce resource transformation to provide more strategic flexibility. A low turbulent environmental status, while being able to predict market changes. At this status, it can make firms feel that their need for strategic flexibility is insignificant. Thus, investment in developing strategic flexibility are eliminated (Ige & Roberts, 2022).

Buganza, Dell'Era, and Verganti (2009) also state that technological turbulence shows the speed of technology updates and new technological breakthroughs. The turbulent technological environment represents a potential technological opportunity for firms to recognize the role of strategic flexibility in addressing such uncertainties. Strategic flexibility is a powerful direction to help firms fully prepare for rapid change. That is Chen et al. (2018) insist that in a turbulent technological environment, firms are under increasing pressure to respond to dramatic technological changes. In efforts to develop strategic flexibility, additional support from employers and employees is obtained. This means that high levels of technological turbulence can accelerate the revolution of flexibility and strategic agility.

This study indicates that technology and market turbulence have the substantial roles necessary in developing firm strategic agility, which is valuable to improve in accomplishment when environmental conditions affect firm existence in a highly dynamic environment (Jones & Knoppen, 2018), and the hypotheses are:

Hypothesis 1: *Technological turbulence has a positive impact on firms' strategic agility.*

Hypothesis 2: *Market turbulence has a positive impact on firm strategic agility.*

Cloud Computing Capability

Cloud computing can define as an emerging form of information technology resource that requires firms to improve processes (Boonlua et al., 2022). Cloud computing has become increasingly accepted in both the public and private sectors. Cloud computing refers to a service model of information technology resources based on the cyberspace that cloud computing offers, including infrastructure, platforms, and software (Coreynen et al., 2020). The disruptive technology in business models and environmental turbulence in firms must employ cloud computing to faster react to those changes, develop firm capabilities in turbulent environments, and overcome a competitive advantage (Liu et al., 2018). Examples of cloud computing providers including Alibaba, Amazon, Google, IBM, and Microsoft are well-known as cloud providers, and a sample of cloud computing providers such as Google offers customer firms Google's cloud-based platform. Like Microsoft, Microsoft builds Windows Azure as a cloud operating system (Gao & Sunyaev, 2019).

Cloud computing capability is known as a transformation of traditional information technology infrastructure capability (Ooi et al., 2018). Cloud computing can be characterized by pay-per-use, supply sharing, and elasticity. The characteristics of cloud computing capability can be put into two features such as (1) cloud computing flexibility, which is the degree to which firms carry out cloud-based information technology solutions quickly and effectively to help the business (Liu et al., 2018); and (2) cloud computing integration, which is the degree to which firms have integrated resources from internal and external information technology based on cloud computing technology (Khayer et al., 2017). According to cloud computing research, Liu et al. (2016) state that flexibility and integration are critical for firms to increase and maintain strategic agility, which supports both features.

Cloud computing could be a key driver of organizational innovation. Zumitzavan and Udchachone (2014) asserted in their study on the hospitality industry in Thailand that innovative approaches within organizations, facilitated by leadership styles, could significantly enhance organizational performance. Extending their insights to the context of this study, the flexibility, scalability, and accessibility afforded by cloud computing can foster an environment that promotes innovation, thereby potentially leading to improved performance in the e-commerce sector.

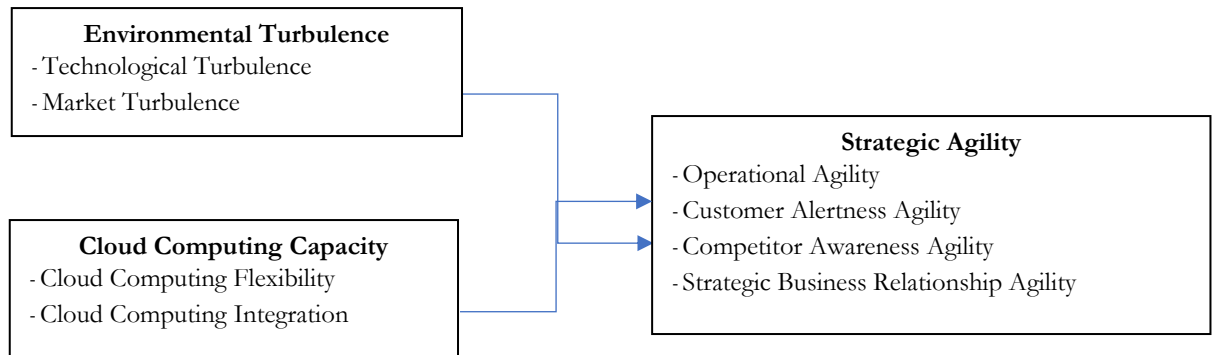
Drawing upon the constructs of dynamic capabilities and contingency theory, this study posits that cloud computing capacity can influence strategic agility (operational agility, customer alertness agility, competitor awareness agility, and strategic business relationship agility). The facilitative role of cloud computing enhances the ability of strategic agility to perceive and respond to changes (Liu et al., 2016; 2018) swiftly and effectively. Liu et al. (2016) found that the capabilities of cloud infrastructure flexibility have stimulated firms to conduct business more agilely through effective strategic decision-making and building up new opportunities with efficient processes in a shorter time frame. Therefore, cloud computing positively affects strategic agility by fulfilling customer needs. Moreover, Khayer et al. (2020) demonstrated that cloud computing can develop firm agility by increasing firms' capacities to quickly respond to a turbulent environment. Thus, the hypotheses are:

Hypothesis 3: *Cloud computing flexibility has a positive impact on strategic agility.*

Hypothesis 4: *Cloud computing integration has a positive impact on strategic agility.*

Synthesizing prior research on strategic agility within the frameworks of dynamic capability and contingency theory, this study delineates four primary determinants of an organization's strategic agility. Strategically agile firms have learned to execute rapid pivots, effectuate organizational transformations without forfeiting momentum, and significantly foster organizational performance due to the agility-centric goals they establish, embodying the aspirational future state of the firm (Petrosyan, 2019; Queiroz et al., 2018). The agility literature points out that management objectives consist of encounters that lead to the creation of firm value and because of controlling the firm's capabilities. In this light, this study considers firm strategic agility as a multi-dimensional competency of organizations. An analysis of strategic objectives to bolster firms' strengths and minimize their weaknesses is conducted within this study. The accomplishments of firms, measured in both financial and non-financial terms, signify the competitive advantages they possess.

This study undertakes an analytical exploration of strategic objectives with the aim of augmenting the strengths of firms and mitigating their weaknesses. The successes of these firms serve as indicators of their competitive advantages in both fiscal and non-fiscal domains. The conceptual model that has been constructed to depict firm strategic agility is illustrated in Figure 1.

Figure 1: Study Framework

According to the complex nature of firm strategic agility that leads this study, environmental turbulence and cloud computing capacity utilized agility as a strategic orientation. Thus, strategic agility refers to the vital outcome and accomplishing of turbulence and capacity of the firm, which the agile firm wants to achieve goals.

Methodology

Sample Selection and Data Collection

Population and Sample

Most agile research has examined agility as a sector with a strong production bias. However, this study defines the context of e-Commerce by the Department of Business Development (2022), Ministry of Commerce Report on the number of e-Commerce businesses increasing in all sectors, more than 10,000 in 2020, such as nutrition, clothing, furniture, software, hardware, etc. across Thailand. Every business sector generates huge revenues of over 20,000 million baht; that may come from the number of internet users that has skyrocketed to 50 million people in Thailand. The e-Commerce business has grown in popularity in recent years and has attracted huge customer demand. This makes e-Commerce businesses in Thailand more creative activities to engage potential customers with a shopping experience (Electronic Transactions Development Agency, 2021). In addition, the entry of Chinese online merchants has caused a new online war. Because Chinese products are becoming more popular in e-market places, especially online entertainment, games, and technological devices (Li et al., 2019). Therefore, the e-Commerce business in Thailand has more competitors. And they may have more creative ideas for unique products and services to appeal to niche markets, not mass market.

The dataset from the Department of Business Development, Ministry of Commerce, was downloaded from www.dbd.go.th in May 2022. The 2,134 e-Commerce businesses in computer, IT, and software package.

The sample size for this study was calculated with Yamane's formula (1967).

$$n = N / (1 + Ne^2)$$

Where,

N = population; n = size of the sample; e² = probability of error

Therefore, the sample size for this study will be:

$$n = 2,134 / [1 + 2,134(0.05)^2]$$

with $N = 2,134$, $e = 0.05$ (level of significance)

Thus, the (least) sample size for this study is 337.

Data Collection

This study used a postal questionnaire to collect data. Due to the large volume of data collected in the academic literature, questionnaires are widely used for data collection (Krejcie & Morgan, 1970). The advantages of questionnaires are that they produce high-quality, usable data, accept good response rates, and reduce bias (Marshall, 2005). This study uses paper and electronic questionnaires (two forms) for sending questionnaires. The first form of the questionnaire is sent to the key informant by postal mail, the second form is electronic mail sent over the internet and a QR code via the LINE application (depending on the requirements or easily accessible of the key informant).

In 2021, a total of 400 questionnaires were sent by post and 111 electronically. Firstly, the researchers received complete questionnaires in the first two weeks. Secondly, after 3 weeks to increase the response rate, the researchers followed up through the chat box function on the website and e-mail of the unanswered e-Commerce business to check and remind them to fill up the questionnaire. Finally, of the 405 questionnaires (postal and electronic questionnaires) returned, 366 were valid and 39 were incomplete and invalid. Therefore, the effective response rate is about 71.62%, which is acceptable and adequate for the next step of data analysis (Boonlua & Phankasem, 2016). The two groups of respondents are divided into 213 e-Commerce businesses that link with the government sector and another 153 e-Commerce businesses that link only with the private sector or non-government sector.

Instrument

The survey questionnaire was developed from reviewing of relevant literatures, publications, books, official reports, and related information. The survey questionnaire is divided into four phases. The first phase is about personal information, including gender, age, level of education, working experience, average monthly income, and position at the workplace. The second phase is information and details of firms, including business type, type of e-Commerce business, type of e-Commerce according to business objectives, number of employees, operating period, registered capital, total assets of the firm, and average income. The third phase is to measure each structure in the study framework. Researchers designed a five-point Likert scale, ranging from 5 (strongly agree) to 1 (strongly disagree). The last phase is an open-ended answer about the suggestions made by the firm's strategic agility.

Validity

Validity shows whether the data collected accurately. The questionnaire or measurement related to this study can accurately and appropriately measure the structure that the researcher desires (Jordan, 2018). Therefore, researcher needs to check the validity and reliability to ensure good quality research. The tables 1 and 2 show the information of validity and reliability tests.

Table 1 shows the average variance extracted (AVE) values are between .504 and .704 for four elements/factors in this study. The results of factors for multiple-item scales are calculated and shows the values of greater than 0.4 with statistical significance which indicated construct validity acceptance (Kwok & Sharp, 1998). This means that the construct or factors or elements used in this study can account for more than half of the variance of the indicators. However, the cut-off value of AVE .40 is acceptable in cases where the construct reliability (CR) value is higher than .60. Thus, the AVEs of all structures indicate sufficient convergence validity.

Table 1. The Average Variance Extracted (AVE) and Construct Reliability (CR) of All Groups of Respondents

Factors	AVE	CR
Operational Agility (OA)	0.611	0.863
Customer Alertness Agility (AA)	0.644	0.879
Competitor Awareness Agility (CA)	0.504	0.801
Strategic Business Relationship Agility (RA)	0.704	0.905

Reliability

Reliability refers to the degree to which the measurements in the questionnaire are true and there is no intervariable error. The method of reliability testing is the main point of validation (Heale & Twycross, 2015). This study employs Cronbach's alpha coefficient to assess the reliability that the measures were error-free and produced consistent results. Cronbach's alpha coefficient method is the most regularly used coefficient method to evaluate the reliability of all variables in the questionnaires. The Cronbach's Alpha coefficient shall be equal or greater than 0.70 which indicates a high reliability (Nunnally & Bernstein, 1994). Table 2 shows the results for Cronbach's alpha coefficients are in a range between 0.746 and 0.859 which are greater than 0.70. This proves the internal concordance of all items contained in this study for all 366 respondents.

Table 2. Reliability Value for All Groups of Respondents

Variables	Items	Cronbach's alpha (α)
Technological Turbulence (TTT)	4	.857
Market Turbulence (TMT)	4	.859
Cloud Computing Flexibility (TCF)	5	.825
Cloud Computing Integration (TCI)	4	.764

Table 3. Reliability Value for Government Group

Variables	Items	Cronbach's alpha (α)
Technological Turbulence (TTT)	4	.853
Market Turbulence (TMT)	4	.811
Cloud Computing Flexibility (TCF)	5	.843
Cloud Computing Integration (TCI)	4	.702

The Cronbach's alpha coefficients of all variables are shown in Table 3, ranging from .702 to .853, which is greater than .70. This also the internal concordance of all items contained in this study for 213 government respondents.

Table 4. Reliability Value for Non-Government Group

Variables	Items	Cronbach's alpha (α)
Technological Turbulence (TTT)	4	.849
Market Turbulence (TMT)	4	.898
Cloud Computing Flexibility (TCF)	5	.785
Cloud Computing Integration (TCI)	4	.799

The Cronbach's alpha coefficients of all variables are shown in Table 4, ranging from .785 to .898, which is greater than .70. This also the internal concordance of all items contained in this study for 153 non-government respondents.

Results and Discussions

General Information of Respondents

The primary respondents for this study occupy administrative roles within e-Commerce enterprises spanning a diverse range of sectors, including nutrition, apparel, furniture, software, and hardware, among others, across Thailand. These respondents represent a wealth of knowledge regarding the resources, policies, culture, strategies, environmental conditions, and stakeholder relationships of their respective firms. Most of respondents are females (61%) aged between 30 and 40 years old (61%). A significant proportion holds a bachelor's degree (56%), possesses 1–5 years of work experience (54%), earns a monthly income between 25,000 and 50,000 baht (32%), and operates an e-Commerce business (59%).

Basic Assumptions for Multicollinearity

This study presents a bivariate correlation analysis for each variable, providing insights into potential multicollinearity issues and examining the interrelationships among variables. Therefore, correlation analysis shows the relational relationship and the direction of the linear relationship between variables (Hair et al., 2006). This study also assesses Variance Inflation Factor (VIF) to test for the severity of multicollinearity between independent variables. The VIF gives an indication that measures how much the variance of the estimated regression coefficient increases because of the comparison. A VIF greater than 10 indicates a high degree of multicollinearity of the independent variables, but the VIF less than 10, the relationship between the independent variables was not problematic (Hair et al., 2006). The correlation results and VIF are detailed in Table 5.

Table 5. Correlation Matrix and Variance Inflation Factor (VIF) for All Constructs

Variables	TTT	TMT	TCF	TCI	TFA
TTT	1.000				
TMT	.746*	1.000			
TCF	.710*	.722*	1.000		
TCI	.669*	.630*	.612*	1.000	
TFA	.400*	.445*	.428*	.443*	1.000
VIFs	2.898	2.797	2.498	2.007	-

Note: * Correlation is significance at the .01 level (two-tailed)

As shown in Table 5, the relation was tested two-tailed test and confirmed significance at the .01 level for all 366 respondents in the study. The correlation matrix in this investigation reveals a correlation value ranging between .400-.445. Each pair of interrelations between variables is lower than .70, suggesting that multicollinearity does not pose a problem in this study (Hair et al., 2006).

Table 6. Correlation Matrix and Variance Inflation Factor (VIF) of All Constructs for Government Group

Variables	TTT	TMT	TCF	TCI	TFA
TTT	1.000				
TMT	.671*	1.000			
TCF	.737*	.711*	1.000		
TCI	.636*	.560*	.537*	1.000	
TFA	.392*	.420*	.436*	.405*	1.000
VIFs	2.781	2.325	2.694	1.776	-

Note: * Correlation is significance at the .01 level (two-tailed)

Table 6, the correlation is subject to a two-tailed test and provides the significance at the .01 level for 213 government respondents. The correlation values are between .392 - .436. This shows the relationship between the variables. Each pair of correlation variables are below .70 to show the correlation between all variables for the preliminary analysis. The multicollinearity may not occur (Hair et al., 2006) in the data of e-Commerce business in the government sector.

Table 7. Correlation Matrix and Variance Inflation Factor (VIF) of All Constructs for non-Government Group

Variables	TIT	TMT	TCF	TCI	TFA
TIT	1.000				
TMT	.813*	1.000			
TCF	.640*	.708*	1.000		
TCI	.676*	.667*	.653*	1.000	
TFA	.393*	.452*	.403*	.464*	1.000
VIFs	3.264	3.637	2.280	2.206	-

Note: * Correlation is significance at the .01 level (two-tailed)

Similarly, Table 7 presents the correlation is subject to a two-tailed test and provides the significance at the .01 level for 153 non-government respondents. The correlation values are between .393 - .464. This also shows the relationship between the variables. Each pair of correlation variables are below .70 to show the correlation between all variables for the preliminary analysis. Thus, a multicollinearity may not occur (Hair et al., 2006) in the data of e-Commerce business in the non-government sector.

To test the hypotheses 1-4, the results of main effect hypotheses of the study framework are investigated in detail as follows.

Table 8 represents the coefficients of strategic agility of e-Commerce in Thailand that are accepted. The adjusted R² for all estimates stood at 24.30%. The Durbin-Watson value of 1.646 indicates the absence of autocorrelation in the data set (Shapiro, 2003). Model 1 shows the coefficients for all 366 respondents (both government and non-government e-Commerce businesses). The Models 2 and 3 represent the coefficients for 213 government e-Commerce businesses and 153 non-government e-Commerce businesses, respectively. All independent and dependent variables have relatively moderate explanatory power (adjusted R² between 22.7%-24.3%). The F-test is significant. The cloud computing integration variable is positive and significant at the 1% level of significance in every model. This shows that the firm strategic agility of e-business in Thailand is significant and positively affected by cloud computing integration. The cloud computing flexibility is positive and significant at the 5% level of significance in Models 1 and 2. Market turbulence is positive and significant at the 5% level of significance in only Model 1. While, technological turbulence is negative and not significant in any model. Hence, increase in cloud computing integration encourages the strategic agility for firms.

Consequently, an increment in all determinants contributes to greater accomplishments for e-business enterprises in Thailand.

Table 8. Coefficient Results for Strategic Agility Performance in Thai e-Commerce Sector

Independent Variables	Model 1 All	Model 2 Government	Model 3 Non-Government
	coefficient	coefficient	coefficient
Constant	5.699** (.046)	5.770** (.054)	5.600** (.079)
Technological Turbulence (TTT)	-.010 (.094)	-.003 (.113)	-.064 (.176)
Market Turbulence (TMT)	.273* (.106)	.208 (.128)	.361 (.194)
Cloud Computing Flexibility (TCF)	.217* (.105)	.304* (.136)	.116 (.175)
Cloud Computing Integration (TCI)	.327** (.090)	.277* (.110)	.419** (.157)
No. of respondents	366	213	153
R ²	.251	.241	.255
R ² Adjusted	.243	.227	.234
F-Statistic	30.303	16.547	12.640
Durbin-Watson	1.646	1.804	1.532

** and * represent statistical significance at 1% and 5% levels, respectively beta coefficients with standard errors in parentheses.

Hypothesis 1: Technological turbulence does not have significant positively influences on strategic agility with a standardized coefficient in every model. Thus, *hypothesis 1 is not supported*. Even technological turbulence is less likely to contribute organizational strategic agility but the Karna, Richter, and Riesenkampff (2016) indicates that the technology associate with firms where need to provide strategic agility for sensing and seizing the unstable business environment. This study result of technology turbulence contradicts Jones & Knoppen's research (2018) indicate that strategic agility of the firm is very significant in environmental turbulence. Moreover, this study results contradict Coreynen et al. (2020) indicates technological turbulence is positively associated with an firm's level of strategic capabilities.

However, the different result may because that this study is investigated e-Commerce businesses in Thailand. The technology turbulence in Thailand does not swiftly change these days. Moreover, Zhou, Mavondo, and Saunders (2019) explain that not all e-Commerce businesses in developing countries (including Thailand) that can take advantage of technological turmoil to be an opportunity for building strategy or competitiveness.

Hypothesis 2: Market turbulence is likely to influence strategic agility for firm. Market turbulence positively influences strategic agility in only Model 1, this may because the market turbulence does not consideration which are government or non-government sectors. The market turbulence implies the rate of changes of customers preferences (Ashrafi et al., 2019). Market turbulence makes current firms' capabilities outdated, requiring the strategic agility to be developed for solving problems for firms. Thus, the sectors of the firm do not count. That is only the Model 1 that *hypothesis 2 is supported* but the hypothesis 2 is not supported in Models 2 and 3.

Hypothesis 3: Cloud computing flexibility is likely to contribute strategic agility of the firm. *Hypothesis 3 is supported* in Models 1 and 2 but not in the Model 3 at the 5% level of statistical significance. This is to confirm Liu et al.'s (2018) research that cloud computing flexibility shows the degree to which firms deliver cloud-based information technology solutions swiftly and essentially to accelerate the business (Liu et al., 2018). This study results confirm Teece, Peteraf, and Leih's statement (2016) that the cloud computing flexibility can stimulated firms to conduct more agilely by effective strategic decision-making and creating new opportunities with efficient business processes shorter time frame. Thus, cloud computing positively affects to firm strategic agility by making client is more satisfied. Firms should take advantage of strategic ability to compete to meet unpredictable customer demands or better consume customer information which generates customer satisfaction and leads to more product/service offering opportunities. This study find that agility

helps firms to have the agility to recognize the opportunities and threats of their customers and their markets. This indicates that the firm can prepare for new marketing plans and anticipate demand and requirements.

Hypothesis 4: Cloud computing integration is an upgraded version of traditional information technology infrastructure capability (Liu et al., 2016). *Hypothesis 4 is supported* in all models at the 1% level of statistical significance. The results support Khayer et al.'s research (2020) that cloud computing integration acts to develop firm agility by increasing firm capacities to sense and respond to the unpredictable situation. In essence, the adoption and effective utilization of cloud computing can catalyze innovation in organizations, aligning with the insights put forth by Zumitzavan and Udchachone's (2014). This means that cloud computing integration represent the key role to influence firm strategic agility to respond to the unstable customers' product preferences. Firm should provide strategic agility to survive in a highly dynamic business environment. The results of this study assure Deshati (2023) that firms with higher levels of strategic agility have a better chance of survival in dynamic business environments. Cloud-based technologies can help firms quickly adapt to changes in the marketplace. forecast future trends and respond to customer needs which will increase the ability to compete.

Palasak, Boonlua, and Jirawuttinunt (2021) also proved that the key agile capability of firms, especially an e-Commerce business should concern new technology as the cloud computing capacity as the key success determinant to overcome the competitiveness. However, Andavan and Vairaperumal (2023) point out that the main problem of using the cloud computing integration is more storage space, deployment, and maintenance costs.

Thus, this study results confirm that strategic business relationship agility supports firms able to utilize the cloud computing capacity and resources for supporting firms to make decision about the strategic agility and to take the competitive advantage.

Contribution, Limitation and Suggestion

This study presents a productivity approach applicable to e-Commerce businesses and any organization interested in adopting agile capabilities. First, this study underscores the significance of firm strategic agility amidst today's volatile business environment. Enhancing strategic agility can enable firms to respond more effectively to dynamic market conditions, particularly when leveraging the flexibility and integrative capacity of cloud computing. Firms should strive to collect information to better understand fluctuations in customer needs, environmental turbulence, and utilization of external providers. Secondly, firms can employ strategic agility as a means of improving decision-making via rapid implementation timing. Thirdly, firms can promote the agility of strategic business relationships by networking with suppliers, data providers and competitors, which will encourage innovation. Lastly, e-Commerce businesses must adapt swiftly to changing external conditions. Strategic agility is considered a vital competence for long-term success and expansion.

A limitation of this study is that it was conducted during the COVID-19 pandemic, which affected the questionnaire response rate. Data was collected solely from e-Commerce businesses within Thailand. As such, future research can explore this model in other firm contexts, targeting different cultural or country contexts to assess a wider range of business types and regions.

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References

- Abdelilah, B., El Korchi, A., & Balambo, M. A. (2018). Flexibility and agility: evolution and relationship. *Journal of Manufacturing Technology Management*, 7(29), 1138–1162.
- Abidemi, B. T., Abubakar, D. A., Suleiman, I. A., & Salihu, A. M. (2020). The Impact of Market Orientation and Performance Using Environmental Turbulence as a Moderator. *Academic Journal of Economic Studies*, 6(1), 127-133.
- Ahmed, W., Najmi, A., Mustafa, Y., & Khan, A. (2019). Developing model to analyze factors affecting firms' agility and competitive capability: A case of a volatile market. *Journal of Modelling in Management*, 14(2), 476–491.
- Ali, A., Warren, D., & Mathiassen, L. (2017). Cloud-based business services innovation: A risk management model. *International Journal of Information Management*, 37(6), 639-649.
- Andavan, M. T., & Vairaperumal, N. (2023). Cloud computing based deduplication using high-performance grade byte check and fuzzy search technique. *Journal of Intelligent & Fuzzy Systems*, 44(2023), 3411-3425.
- Argote, L. (1999). *Organizational Learning: Creating, Retaining, and Transferring Knowledge*. Boston: Kluwer Academic.
- Ashrafi, A., Zare Ravasan, A., Trkman, P., & Afshari, S. (2019). The role of business analytics capabilities in bolstering firms' agility and performance. *International Journal of Information Management*, 47(2), 1–15.
- Bliemel, M., McCarthy, I., & Maine, E. (2014). An Integrated Approach to Studying Multiplexity in Entrepreneurial Networks. *Entrepreneurship Research Journal*, 4(4), 367-402.
- Boonlua, S., Gan, C., Palasak, S., & Chuwiruch, N. (2022). Strategid Agility Determinance: Achieving Organisational Goals in the E-Commerce Business, Thailand. *Journal of Algebraic Statistics*, 13(3), 4747-4761.
- Boonlua, S., & Phankasem, S. (2016). Engagement in integrated reporting: evidence from the international integrating reporting council adoption framework. *Journal of Business and Retail Management Research*, 10(3), 126-136.
- Buganza, T., Dell'Era, C., & Verganti, R. (2009). Exploring the Relationships between Product Development and Environmental Turbulence: The Case of Mobile Tlc Services. *Journal of Product Innovation and Management*, 26(3), 308-321.
- Calantone, R., Gacia, R. & Droge, C. (2003). The Effects of Environmental Turbulence on New Product Development Strategy Planning. *The Journal of Product Innovation Management*, 20, 90-103.
- Chen, T. T., Li, F., Chen, X. P., & Ou, Z. Y. (2018). Innovate or Die: How Should Knowledge-Worker Teams Respond to Technological Turbulence? *Organizational Behavior and Human Decision Processes*, 149, 1-16.
- Chen, Y. (2021). The Impact of Responsibility Delegation on Policy and Practice Implementation: A Contingency Approach. *Public Performance & Management Review*, 44(4), 842-867.
- Coreynen, W., Matthyssens, P., Vanderstraeten, J., & van Witteloostuijn, A. (2020). Unravelling the internal and external drivers of digital servitization: A dynamic capabilities and contingency perspective on firm strategy. *Industrial Marketing Management*, 20(2), 20-25.
- Darvishmotevali, M., Altinay, L., & Köseoglu, M. A. (2020). The link between environmental uncertainty, organizational agility, and organizational creativity in the hotel industry. *International Journal of Hospitality Management*, 87(4), 40-45.
- Denning, S. (2019). The quest for genuine business agility. *Strategy and Leadership*, 1(48), 21–28.
- Department of Business Development. (2022). Retrieved on May 3, 2022 from <https://www.dbd.go.th/>
- Deshati, E. (2023). Staying Ahead of the Curve: An Analysis of Strategic Agility and Its Role in Ensuring

- Firm Survival in a Dynamic Business Environment. *European Scientific Journal*, 19(13), 28-48.
- Dill, W. R. (1958). Environment as an influence on managerial autonomy. *Administrative Science Quarterly*, 2(4), 409-443.
- Dove, R. (1991). *21st century manufacturing enterprise strategy: An industry-led view*. Bethlehem, U.S.: Diane Publishing.
- Doz, Y. (2020). Fostering strategic agility: How individual executives and human resource practices contribute. *Human Resource Management Review*, 30(1), 48-53.
- Dyk, R., & Belle, J-P. (2019). Factors Influencing the intended Adoption of Digital Transformation: A South African Case Study. *Proceedings of the Federal Conference on Computer Science and Information Systems*, 18, 519-528.
- Eisenhardt, K. M., & Martin, J., A. (2000). Dynamic Capabilities: What Are They? *Strategic Management Journal*, 21, 1105-1121.
- Electronic Transactions Development Agency. (2021). Retrieved on June 12, 2021 from <https://www.eta.or.th/th/>
- Feroz, A. K., Zo, H., & Chiravuri, A. (2021). Digital Transformation and Environmental Sustainability: A Review and Research Agenda. *Sustainability*, 13(1530), 1-20.
- Gagel, G. (2017). The Intersection of Organizational Agility and Transformational Leadership: A Literature Review. *Academy of Management Proceedings*, 2017(1), 10895. Briarcliff Manor, NY: Academy of Management.
- Gao, F., & Sunyaev, A. (2019). Context matters: A review of the determinant factors in the decision to adopt cloud computing in healthcare. *International Journal of Information Management*, 2(48), 120–138.
- Grotsch, V., M., Blome, C., & Sclerper, M. C. (2013). Antecedents of proactive supply chain risk management – a contingency theory perspective. *International Journal of Production Research*, 51(10), 2842-2867.
- Gunsberg, D., Callow, B., Ryan, B., Suthers, J., Baker, P. A., & Richardson, J. (2018). Applying an organisational agility maturity model. *Journal of Organizational Change Management*, 31(6), 1315–1343.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate Data Analysis*. Upper Saddle River, NJ: Pearson Prentice Hall.
- Haleblian, J., & Finkelstein, S. (1993). Top Management Team Size, CEO Dominance, and Firm Performance: The Moderating Roles of Environmental Turbulence and Discretion. *Academy of Management Journal*, 36(4), 844-863.
- Handoko, I. & Tjaturpriono, H. (2023). The Dynamic Capabilities of High-Turbulent Markets: Indonesian Start-Up Cases During COVID-19 Pandemic. *Entrepreneurship Research Journal*, April(2023), 1-28.
- Heale, R., & Twycross, A. (2015). Validity and reliability in quantitative studies. *Evidence-Based Nursing*, 18(3), 66-67.
- Ige, A., & Roberts, M. (2022). Practice-enabled Organizational Change: Practice Reconfiguration through Environmental Turbulence. *Change Management: An International Journal*, 22(2), 61-80.
- Irfan, M., Wang, M., & Akhtar, N. (2019). Impact of IT capabilities on supply chain capabilities and organizational agility: a dynamic capability view. *Operations Management Research*, 12(3–4), 113–128.
- Jones, A., & Knoppen, D. (2018). The role of strategic purchasing in dynamic capability development and deployment: A contingency perspective. *International Journal of Operations and Production Management*, 38(2), 446-473.
- Jordan, K. (2018). Validity, Reliability, and the Case for Participant-Centered Research: Reflections on a Multi-

- Platform Social Media Study. *International Journal of Human-Computer Interaction*, 34(10), 913-921.
- Karna, A., Richter, A. & Riesenkampff, E. (2016). Revisiting the role of the environment in the capabilities–financial performance relationship: A meta-analysis. *Strategic Management Journal*, 37(6), 1154-1173.
- Khayer, A., Jahan, N., Hossain, M. N., & Hossain, M. Y. (2020). The adoption of cloud computing in small and medium enterprises: a developing country perspective. *VINE Journal of Information and Knowledge Management Systems*, 9(1), 21-36.
- Kimberlin, C. L., & Winterstein, A. G. (2008). Validity and reliability of measurement instruments used in research. *American Journal of Health-System Pharmacy*, 65(23), 2276-2284.
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30, 607-610.
- Kumar, A., & Andotra, N. (2021). Environmental Turbulence, Government Support, and Organisational Performance: A Study of SMEs. *International Journal of Applied Marketing and Management*, 6(1), 23-33.
- Kwok, W. C., & Sharp, D. J. (1998). A Review of Construct Measurement Issues in Behavioral Accounting Research. *Journal of Accounting Literature*, 17, 137-174.
- Lawrence, P. R., & Lorsch, J. W. (1967). Differentiation and integration in complex organizations. *Administrative Science Quarterly*, 12(1), 1- 47.
- Li, L. Q., Xin, K., Pucik, V., & Wei, W. X. (2019). MNCs' R&D talent management in China: aligning practices with strategies. *Chinese Management Studies*, 13(4), 1086–1106.
- Lin, J., Li, L., Luo, X. R., & Benitez, J. (2020). How do agribusinesses thrive through complexity? The pivotal role of e-commerce capability and business agility. *Decision Support Systems*, 135(2020).
- Liu, S., Chan, F. T. S., Yang, J., & Niu, B. (2018). Understanding the effect of cloud computing on organizational agility: An empirical examination. *International Journal of Information Management*, 43(3), 98–111.
- Liu, S., Yang, Y., Qu, W. G., & Liu, Y. (2016). The business value of cloud computing: The partnering agility perspective. *Industrial Management and Data Systems*, 6(116), 1160–1177.
- Mandal, S. (2019). Exploring the influence of IT capabilities on agility and resilience in tourism: Moderating role of technology orientation. *Journal of Hospitality and Tourism Technology*, 10(3), 431–444.
- Marshall, G. (2005). The purpose, design and administration of a questionnaire for data collection. *Radiography*, 2(11), 131–136.
- McAdam, R., Miller, K., & McSorley, C. (2019). Towards a contingency theory perspective of quality management in enabling strategic alignment. *International Journal of Production Economics*, 7(19), 195-209.
- Nejatian, M., Zarei, M. H., Nejati, M., & Zanjirchi, S. M. (2018). A hybrid approach to achieve organizational agility: An empirical study of a food company. *Benchmarking*, 25(1), 201–234.
- Nunnally, J. C., & Bernstein, I. H. (1994). The Assessment of Reliability. *Psychometric Theory*, 3, 248-292.
- Nurcholis, L. (2019). The mediating effect of knowledge exploitability and organizational agility at relationship between marketing adaptation strategy and sustainable competitive advantage. *Contaduría y Administración*, 66(1), 1–30.
- Ooi, K-B., Lee, V-H., Tan, G., Hew, T-S., & Hew, J-J. (2018). Cloud computing in manufacturing: The next industrial revolution in Malaysia? *Expert Systems With Applications*, 93(2018), 376-394.
- Palasak, S., Boonlua, S., & Jirawuttinunt, S. (2021). Organizational Strategic Agility And Goal Achievement: an Empirical Study In Electronic Commerce. *Natural Volatiles & Essential Oils*, 8(5), 8383-8409.
- Petrosyan, A. (2019). Whirling in between the personal and the impersonal: The quest for the marrow of organizational goals, and the lessons to be drawn thence. *Journal of Management History*, 25(2), 257-284.

- Pundziene, A., Gutmann, T., Schlichtner, M., & Teece, D. J. (2022). Value Impedance and Dynamic Capabilities: The Case of MedTech Incumbent-Born Digital Healthcare Platforms. *California Management Review*, 64(4), 108-134.
- Queiroz, M., Tallon, P. P., Sharma, R., & Coltman, T. (2018). The role of IT application orchestration capability in improving agility and performance. *Journal of Strategic Information Systems*, 27(1), 4-21.
- Rascao, J., P. (2021). The Value of Economic Information in the Digital Society. *Journal of Technology Advancements*, 1(1), 1-33.
- Richardt, T., Emmerich, P., & Salomo, S. (2021). Agility through Self-Organization: A Five-Step Process for the Digital Transformation. *Proceedings in the ISPIIM Innovation Conference-Innovating Our Common Future, Berlin, Germany*, June, 1-16.
- Rumelt, R. P. (1991). How much does industry matter? *Strategic Management Journal*, 12(3), 167-185.
- Sambamurthy, V., Bharadwaj, A., & Grover, V. (2003). Shaping Agility through Digital Options: Reconceptualizing the Role of Information Technology in Contemporary Firms. *MIS Quarterly*, 2(27), 237-263.
- Srivastava, B., & Mir, R. (2020). Relating Dynamic Capabilities to Industry Structure: An Integrative Approach to Firm Strategy. *American Journal of Management*, 20(5), 90-102.
- Tallon, P. P., Queiroz, M., Coltman, T., & Sharma, R. (2019). Information technology and the search for organizational agility: A systematic review with future research possibilities. *The Journal of Strategic Information Systems*, 28(2), 218-237.
- Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28(13), 1319–1350.
- Teece, D. J. (2018). Profiting from innovation in the digital economy: Enabling technologies, standards, and licensing models in the wireless world. *Research Policy*, 47(8), 1367-1387.
- Teece, D. J. (2019). A capability theory of the firm: an economics and (Strategic) management perspective. *New Zealand Economic Papers*, 53(1), 1–43.
- Teece, D., Peteraf, M., & Leih, S. (2016). Dynamic capabilities and organizational agility: Risk, uncertainty, and strategy in the innovation economy. *California Management Review*, 58(4), 13–35.
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509-533.
- Udchachone, S. (2020). *Airline Brand Experience: Passengers' Perceptions of the Big Three Carriers in the United States* (Doctoral dissertation, Florida Institute of Technology).
- Xi, C., Hariza, H., Syuhaily, O., Leby, L., & Cheng-Xi, A. (2023). The future of e-commerce? Understanding livestreaming commerce continuance usage. *International Journal of Retail and Distribution Management*, 51(1), 1-20.
- Yamane, T. (1967). *Statistics: An Introductory Analysis* (2nd ed), New York: Harper and Row.
- Zhou, J., Mavondo, F., & Saunders, S. (2019). The relationship between marketing agility and financial performance under different levels of market turbulence. *Industrial Marketing Management*, 83(3), 31–41.
- Zumitzavan, V., & Udchachone, S. (2014). The Influence of Leadership styles on Organisational Performance mediated by Organisational Innovation: A case study of the hospitality industry in Thailand. *Recent Advances in Economics, Management, and Development*.