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The Dynamic Capability, Innovation, Competitive Advantage, and Survival of Tech Startups

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Abstract

This study aims to bridge the research gap by exploring the impact of dynamic capability and innovation on startup survival. It tests the mediating roles of competitive advantage and scrutinizes the moderating role of dynamic capabilities in the relationship between innovation and startup survival. The sample group consisted of 170 tech-startups in Thailand. We calculated the sample size based on the estimated parameter ratio for each sample, which was determined using stratified random sampling. We conducted online (Google Forms) and paper (post office) surveys after systematic sampling. The analysis included confirmatory factor analysis (CFA) and structural equation modeling (SEM). The causal relationship model and the empirical data agreed well without adjusting the model, and it was found that dynamic capability did not have a direct effect on the survival of startups. However, the influence of dynamic capability and innovation on the survival of startups through competitive advantage was found to have statistical significance. Furthermore, startups can amplify the impact of innovation on competitive advantage by enhancing their dynamic capabilities. Startups can achieve this by identifying and recognizing opportunities that arise from environmental changes, absorption, and reconfiguration. The implication identified in this research is that startups have a better chance of survival when they have a competitive advantage, employ and encourage innovation, and implement dynamic capability.

Keywords: Dynamic Capability; Innovation; Competitive Advantage; Survival; Tech Startups.

1. Introduction

Startups are newly formed businesses that confront significant uncertainty [1], usually during the initial phases of development and expansion, marked by innovation, job generation, and swift company scaling [2]. Startups have evolved into significant catalysts for economic development and employment creation while also serving as a driving force for radical innovation. Startups are nascent enterprises that participate in entrepreneurial endeavors and typically have a duration of 3 to 5 years. Startups are regarded as more susceptible than established enterprises.

The COVID-19 pandemic is clearly one of the most recent and dramatic examples of turbulent climatic conditions, heightened competition, and unexpected technological advances. It shows that the current business environment has some unique characteristics that are hard to predict. To enable organizations to adapt and survive in a rapidly changing business environment, organizational dynamics play an important role in achieving competitive advantage [3]. Therefore, startups need to build dynamic capabilities to survive in such critical situations. Because of these

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circumstances, firms must recognize the importance of gaining a competitive advantage. Both established businesses and startups must use their competitive advantage to adapt to sudden environmental changes and fierce competition [4].

The ability of a firm to assimilate, expand, and reorganize both internal and external resources in order to adapt to rapidly changing business conditions is known as dynamic capabilities [5]. The empowerment of a firm's dynamic capacities is critical in creating a competitive advantage and ensuring firm survival. Previous empirical research revealed that dynamic capabilities have a considerable impact on competitive advantage [6, 7]. Starting a new business often presents challenges and requires constant adjustments. It necessitates methodical management and dynamic capabilities. These organizational capabilities and resources can give startups a competitive edge, enabling them to grow rapidly and ensure their survival. We investigate whether core capabilities are critical for startup survival using the dynamic capabilities approach from the sensing, seizing, and reconfiguring viewpoints [8]. In doing so, we firmly integrate the dynamic capacity perspective, previously overlooked, into our understanding of startup survival. Dynamic capabilities also possibly affect adaptability in human resource development during long-term crises [9].

Innovation has become critical for all modern businesses to survive in a world marked by competitiveness, technological development, and periodic crises [10]. Product and process innovation can result from process-product interaction [11]. This is appropriate for startups that can adapt their processes to respond swiftly to customer needs based on the target audience. As a result, innovation is a crucial instrument in an organization's operations and a critical component that keeps enterprises alive and growing; it promotes the development and expansion of the business and raises its chances of success in the future [10]. Organizational innovation can help businesses to gain a competitive advantage [12]. As a result, we investigate organizational innovation in terms of organizational resources using resource-based theory to answer the question of how organizational participation processes generate highly esteemed, rare, unique, and non-substitutable resources [13] and assist firms in surviving in rapidly changing, complex, and unpredictable situations such as the COVID-19 pandemic, in which organizations with high overall innovation may outperform others.

Innovation is a crucial factor that allows entrepreneurs to differentiate themselves in very competitive marketplaces. By concentrating on critical aspects such as product quality, operational processes, and customer experience, innovation enables startups to minimize operating expenses, enhance efficiency, and develop unique products or services that align with market demand. This strategic distinction allows entrepreneurs to secure a greater market share while maintaining their competitive advantage over time. Innovation is essential for both competitive advantage and the survival of companies. Investing in innovation creates new market prospects, improves corporate processes, and fortifies competitive advantages, all of which are crucial for success in the contemporary business landscape. Startups are recognized for their capacity to introduce novel products, innovative business strategies, and offer unique commercial value to the market rapidly, frequently utilizing advanced technology. They maintain ongoing discussions with prospective clients to identify deficiencies in existing products, while iterating and experimenting to discover business models that are both replicable and scalable. Their readiness to adapt swiftly when an opportunity fails is a defining characteristic of their agility [14]. Nonetheless, despite these advantages, the survival rate of startups is comparatively low relative to other kinds of businesses. This highlights the crucial need to identify the factors that contribute to the survival and success of startups.

How startups develop internal resources and competencies, take advantage of partnerships, and carry out strategic initiatives to expand and compete with more established businesses is yet unclear [15]. According to the dynamic capabilities theory and resource-based view, this study is quantitative in character. We highlight sensing, seizing, and reconfiguration capabilities as key components of dynamic capacities in startups. Startup managers or founders can use their capabilities to sense, absorb, and reconfigure, as explained by Teece's [8] dynamic capabilities theory. Previous research by Schoemaker et al. [16] suggested that having entrepreneurial leaders within the top management team is crucial. Strong dynamic capabilities alone are not sufficient; business model innovation, dynamic capabilities, and strategic leadership must be aligned to help organizations thrive in a volatile environment. Cao et al. [17] proposed that companies can achieve sustainable competitive advantage by leveraging their ability to perceive, seize, and reconfigure through market analysis, marketing decisions, and product development management. Feng et al. [18] underscored the importance of examining dynamic capabilities and resources inside startups, particularly in the realms of service provision and technical innovation across different nations. Sijabat et al. [19] presented a new business venture that could achieve a competitive edge by enhancing its dynamic capacities through fostering entrepreneurial creativity and ambidextrous innovation to address severe competition and to adapt to unforeseen environmental changes. Additionally, Corvello et al. [20] proposed the use of dynamic capabilities to identify startups' responses to failures and impacts. They suggested a three-dimensional response strategy of dynamic capabilities, which is crucial for startups to overcome difficulties, to continue their growth and innovation, and to develop strategies for systemic learning from failures. Furthermore, Eurico Soares de Noronha et al. [21] presented a model for managing dynamic capabilities (ODCs) in clean technology companies aiming to gain a competitive advantage in the market. Hiroshi Usirono et al. [22] proposed an approach to developing dynamic capabilities from existing resources in the startup ecosystem, considering different management characteristics and environments. The latest work focuses on qualitative content analysis. From the perspective of dynamic capabilities, only a limited number of academic studies have explored strategies for achieving

competitive advantage and startup survival. From the context analysis, we can bridge this gap. This study, therefore, explores how innovation and dynamic capabilities contribute to both survival and competitive advantage. Current research often focuses on the impact of innovative practices on performance. This study takes it further by examining the moderating role of dynamic capabilities in the relationship between innovation and the survival of startups, specifically focusing on the startup landscape in Thailand.

In response to the unprecedented challenges posed by uncertain environments, such as the COVID-19 pandemic, this study hypothesizes that an organization's dynamic capabilities, coupled with its innovative potential, significantly enhance its competitive advantage and, consequently, its chances of survival. This research aims to contribute to the existing literature on dynamic capabilities, innovation, and competitive advantage during times of crisis, providing additional insights for startup founders and policymakers on how to foster startup growth by leveraging the positive impacts of dynamic capabilities and innovation on business survival.

Furthermore, the intersection of dynamic capabilities, innovation, competitive advantage, and survival represents a relatively underexplored research gap in the study of Thai startups. The findings of this research could offer valuable guidance for startups in adapting and evolving in the future. Following a comprehensive literature review, this study will propose a theoretical framework and test the hypotheses. Subsequently, we will present and discuss the data analysis results to highlight our key conclusions.

2. Literature Review

2.1. Resource-based View and Dynamic Capability Theories

The resource-based view theory (RBV) focuses on internal resources that create competitive advantage so that business organizations can increase their competitiveness and be better able to survive. Dynamic Capabilities Theory explains organizational capabilities that help organizations to survive in rapidly changing environments. However, a link exists between dynamic capabilities and RBV theory. Although focusing on the company's internal operations and resources, the environmental context in which the business operates is also important, according to dynamic capacity theory [8]. Recent studies have underscored the importance of sustaining a competitive advantage through an integrated strategy that combines the capabilities of both resource-based and dynamic capacity frameworks [23-25]. The RBV underscores the importance of valuable, rare, inimitable, and non-substitutable resources as essential elements for attaining sustained success while dynamic capabilities, which complement the RBV and emphasize the company's ability to identify opportunities and risks, capitalize on them, and reallocate resources in response to external changes, are crucial for successfully navigating extremely unpredictable markets.

Thus, this study, utilizing RBV and dynamic capability theory, demonstrates that startups leverage innovation originating from internal resources and dynamic capabilities. This gives organizations a competitive edge, which helps them grow and stay in business [26]. To react and adapt to the constantly changing work environment, particularly during a crisis, it is crucial to establish a work environment with dynamic capabilities [27].

2.2. Dynamic Capabilities

Dynamic capabilities empower business organizations to generate, implement, and safeguard intangible assets that facilitate sustained outstanding performance [8]. Consequently, enhancing a company's dynamic skills is crucial for establishing a competitive edge and ensuring organizational sustainability [4]. Dynamic capabilities refer to the competencies of the organization. Designing and implementing a new business model is essential for integrating, constructing, and reconfiguring internal and external capabilities to address a quickly evolving environment.

Teece [8] asserted that dynamic capabilities are organizational competencies that are challenging to imitate and must adapt and transform in response to consumer and technological opportunities. We classify these qualities into three distinct dimensions:

2.2.1. Sensing

This factor relates to the organization's ability to identify and understand opportunities arising from environmental changes. It necessitates the capacity to anticipate future trends and alterations, enabling the company to innovate and develop new competencies.

2.2.2. Seizing

This dimension emphasizes the organization's ability to assimilate and leverage new knowledge to seize opportunities effectively. It includes choosing the right knowledge to take advantage of new opportunities and planning how to take advantage of external opportunities by obtaining, combining, changing, and employing knowledge to get ahead of the competition.

2.2.3. Reconfiguration

This dimension relates to the organization's capacity to reorganize and adjust its resources in response to environmental changes. It underscores the necessity of cultivating innovation and enhancing new competencies within the business to guarantee agility and response to evolving circumstances.

These three dimensions of dynamic capabilities have been widely recognized and cited in academic literature [28, 29]. In regard to the above elements, dynamic capabilities focus on understanding processes, sources, and methods in environments of rapid technological change [5], as well as managers' ability to orchestrate their resources to generate value [30]. Dynamic capabilities have unique characteristics that are considered an important part of any company. Strong dynamic capabilities can build the capacity necessary to deal with the growing uncertainty of innovation and competition in the current market [31]. In the context of startups, the concept of dynamic capabilities encompasses the ability to detect and absorb opportunities when participating in pitching events or platforms for meeting investors, as well as engaging in various programs organized by government agencies to support the interaction between startups and investors. Startups utilize these opportunities to detect and seize knowledge and capabilities from the external environment, and then reconfigure them within the organization to create holistic, dynamic capabilities. Additionally, a new business frequently encounters change and uncertainty, necessitating systematic management and dynamic competence. These organizational capabilities and resources can provide startups with a competitive edge, enabling them to grow faster and survive.

2.3. Innovation

Innovation is often closely linked to creativity as creative ideas typically lead to innovative outcomes. In the business world, innovation is defined as the introduction of new products, services, or processes that give companies a competitive advantage [32]. The definitions of creativity and organizational innovation are closely aligned, with innovation being seen as the practical implementation of creative ideas. Historically, research on innovation has predominantly concentrated on technological developments within manufacturing organizations, emphasizing product innovations, such as items, and process innovations, such as production methods [33, 34]. This emphasis predominantly neglects the significance of innovation inside service firms. In technology-driven sectors, such as tech startups, the strategic utilization of patents and intellectual property enables organizations to provide lucrative, revenue-generating products and services. Utilizing technical innovations can also mitigate financial risk [35].

The structure of innovation often stands out more prominently than creativity, with the two concepts frequently used interchangeably. Innovation places a strong emphasis on practical application [36], making it a catalyst for driving further innovation and enhancing competitive advantage. As a result, this research focuses on measuring innovation based on its implementation, which can be divided into two primary categories:

2.3.1. Technological Intensity

Technological intensity denotes the degree of technological sophistication inside an industry [37], which includes a fully established IT department, reporting software, user-centric products and services, and cutting-edge technology for operational processes [38]. The level of technological intensity can profoundly affect the influence of agglomeration economies on a specific industry. This study examines the technological intensity of startups, investigating how the utilization of innovation can improve their survival and success. By using advanced technologies, startups can more effectively manage competitive advantages and maintain their growth.

2.3.2. Patents and Intellectual Property

Startups often acknowledge the imperative to safeguard their intellectual property, particularly in high-tech industries where innovation is essential. Multiple causes can lead to a startup's failure at different phases of its development, underscoring the necessity of protecting intellectual property from the outset. Formulating and executing a comprehensive intellectual property protection strategy is essential [39]. This research defines patents and intellectual property by the existence of registered items, trademarks, and affiliation with associations that uphold copyright laws [38]. These aspects contribute to the development of a company's distinctive competencies, thus augmenting its competitive advantage and improving the probability of a startup's survival.

These two components are pivotal in evaluating a company's innovative capabilities, providing a clear framework for understanding how businesses can maintain and enhance their competitive edge through innovation. Innovation, in the context of startups, is often viewed as a key differentiator that allows new ventures to compete effectively with established firms. Unlike larger organizations, startups typically operate with limited resources, making their approach to innovation both unique and crucial for survival. The relationship between innovation and firm survival is particularly pronounced during prosperous periods. Kartika [23] stated that innovation plays a crucial role in the success of startups by increasing market share and satisfaction, improving operational efficiency and scalability, and providing unique

competitive advantages. During such times, innovative strategies can provide firms with a distinct competitive advantage, thus enhancing their ability to thrive. However, in challenging economic conditions, the risks associated with innovation increase, making these strategies less effective and more hazardous [40]. This dynamic underscore the critical role of innovation in not only driving competitive advantage, but also in ensuring the long-term viability of startups in fluctuating market environments.

2.4. Survival of Startups

Understanding why some firms survive and others fail is a central question in strategic management research [41], making survival a concept that remains largely unexplored with various interpretations [42]. From the literature review on survival, there is a temporal perspective. That is, startup survival occurs when the startup remains in operation for a certain period or during the period in which the rules are established. It can take a long time to ensure survival in a new market or business system [43, 44]. Additionally, survival has a survivability perspective, which focuses on the organization's ability to operate and maintain stability to ensure long-term survival. Managing the environment and having the flexibility or ability to respond quickly to changing environmental conditions ensures that new businesses do not fail in the face of competition and uncertain environmental changes [45-47]. Therefore, this research focuses on the survival perspective, which emphasizes the importance of organizational survival. It is measured by the level of profitability, which indicates the survivability of the startup.

Weaven et al. [48] found that firms need to be able to develop and deploy specific dynamic capabilities when confronted by a crisis. The impact of organizational resources that represent dynamic capabilities for firm survival, which depends on the natural ecosystem of relationships [49], therefore needs to be tested. In the context of Thailand, the relationship between dynamic capabilities and the survival of startups is examined, where innovation is a key driver of competitive advantage, especially for startups operating in highly dynamic markets. The study by Huang & Ichikohji [50] demonstrated the utilization of dynamic capabilities and business model innovation for the sustainable survival of organizations. It clearly showed a positive relationship between dynamic capabilities, business model innovation, and organizational performance. Business model innovation was found to play a crucial role as a channel through which dynamic capabilities can translate into higher performance. According to Ziemnowicz [51], innovation involves the introduction of new combinations of production factors that disrupt existing market structures, giving firms a temporary monopoly through their innovations. Hyytinen [52] found that a startup's innovativeness is negatively associated with its subsequent survival, several studies have highlighted the positive relationship between innovation and startup survival [50, 53, 54]. Therefore, the following hypotheses are proposed:

H1: Dynamic capabilities have a positive effect on the survival of startups.

H2: Innovation has a positive effect on the survival of startups.

2.5. The Mediating Role of Competitive Advantage

Competitive advantage, as discussed within the framework of the resource-based theory, emphasizes the importance of an organization's valuable, rare, inimitable, and non-substitutable resources and capabilities in establishing a competitive edge [13]. Porter [39] highlighted the need for organizations to recognize competitive advantage as a strategic goal, providing tools to analyze the pressures within the competitive environment. Grant [55] further argued that companies must capitalize on competitive advantage through unique capabilities and resource alignment, which are crucial in shaping business strategies. By integrating RBV and DCs, companies can navigate uncertainty more effectively, ensuring a sustainable competitive advantage in rapidly changing markets [25].

The study of competitive advantage offers broad insights as organizations must continuously seek methods to gain and sustain it. The literature review has identified multiple dimensions of competitive advantage, which this research categorizes as cost leadership, quality, differentiation, and responsiveness:

2.5.1. Cost Leadership

This dimension involves a strong emphasis on cost reduction through advanced cost control systems and the optimal sourcing of resources, including labor, materials, and equipment [56].

2.5.2. Quality

For startups, maintaining high-quality products or services is a primary goal. Quality is seen as a core responsibility with the aim of achieving the highest standards and the ability to make swift decisions that enhance quality [57].

2.5.3. Differentiation

Differentiation is achieved by creating a distinctive brand image, offering superior service quality compared to competitors, and providing additional value to customers through innovative methods or new services [58].

2.5.4. Responsiveness

Responsiveness focuses on the company's commitment to customer satisfaction. Employees are trained and empowered to respond promptly to customer needs, ensuring high levels of satisfaction through direct interaction [57].

The integration of these resources and capabilities makes an organization distinctive, enabling it to gain competitive advantage and maintain strategic awareness, especially in a changing environment [59]. Organizations that can sustain their competitive edge are more likely to survive. Research consistently shows that competitive advantage positively impacts a company's survival [57, 60], with dynamic capabilities playing a crucial role in enhancing competitive advantage [6, 7, 29, 61-63]. Furthermore, the alignment of dynamic capabilities with organizational resources is essential for survival, particularly within the natural ecosystem of relationships, including the Latin American context [49]. Therefore, it is necessary to test it in a Thai context.

Innovation and dynamic capabilities are key drivers of competitive advantage, with dynamic capabilities acting as a moderating variable in the relationship between innovation and competitive advantage. Dynamic capabilities involve the continuous alignment of a firm's behavior to develop new resources and core capabilities in response to changes, particularly in technology-driven environments [29, 64]. Research, including studies by Khouroh et al. [65] and Ogunkoya et al. [66], consistently demonstrates that dynamic capabilities positively influence sustainable competitive advantage, especially in SMEs. Therefore, developing dynamic skills is essential for enhancing competitive advantage [67], and this competitive advantage serves as a mediator in the relationship between innovation and organizational survival [51].

From the literature review on Dynamic Capabilities, Innovation, Competitive Advantage and the Survival of Tech Startups, the hypotheses are as follows:

H3: Dynamic capabilities have a positive effect on competitive advantage.

H4: Innovation has a positive effect on competitive advantage.

H5: Competitive advantage has a positive effect on the survival of startups.

H6: Competitive advantage has a significant mediating role between dynamic capabilities and the survival of startups.

H7: Competitive advantage has a significant mediating role between innovation and the survival of startups.

2.6. The Moderating Role of Dynamic Capabilities

In recent years, the concept of dynamic capabilities has garnered significant attention in the field of strategic management, particularly concerning its moderating role in the relationship between innovation and competitive advantage. Dynamic capabilities, defined as a firm's ability to integrate, build, and reconfigure internal and external resources to address rapidly changing environments, have been recognized as a critical factor in sustaining competitive advantage in the face of innovation [68].

Several studies have explored how dynamic capabilities influence the innovation-competitive advantage nexus. For instance, the role of dynamic capabilities is particularly evident in industries characterized by rapid technological change [69]. Furthermore, recent studies emphasize the importance of a firm's learning orientation as a dynamic capability that moderates the innovation-competitive advantage relationship. For example, a study by Wilden et al. [70] found that firms with a strong learning orientation are better able to leverage their innovation efforts into sustained competitive advantage. This is because these firms are continually learning from their innovation experiences, which allows them to refine their strategies and processes over time. From the literature review [71], the hypothesis is as follows:

H8: Dynamic capabilities have a significant moderating role between innovation and competitive advantage.

The conceptual framework, as illustrated in Figure 1, represents the determination of hypotheses.

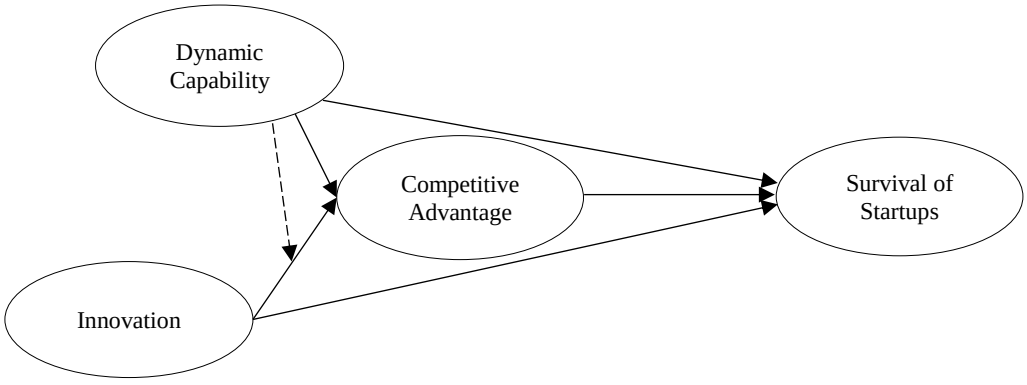


Figure 1. This study's conceptual model diagram illustrates the moderating effects, as indicated by the dotted lines

3. Research Design and Data Collection

The flowchart illustrates the methodology applied in this investigation (Figure 2).

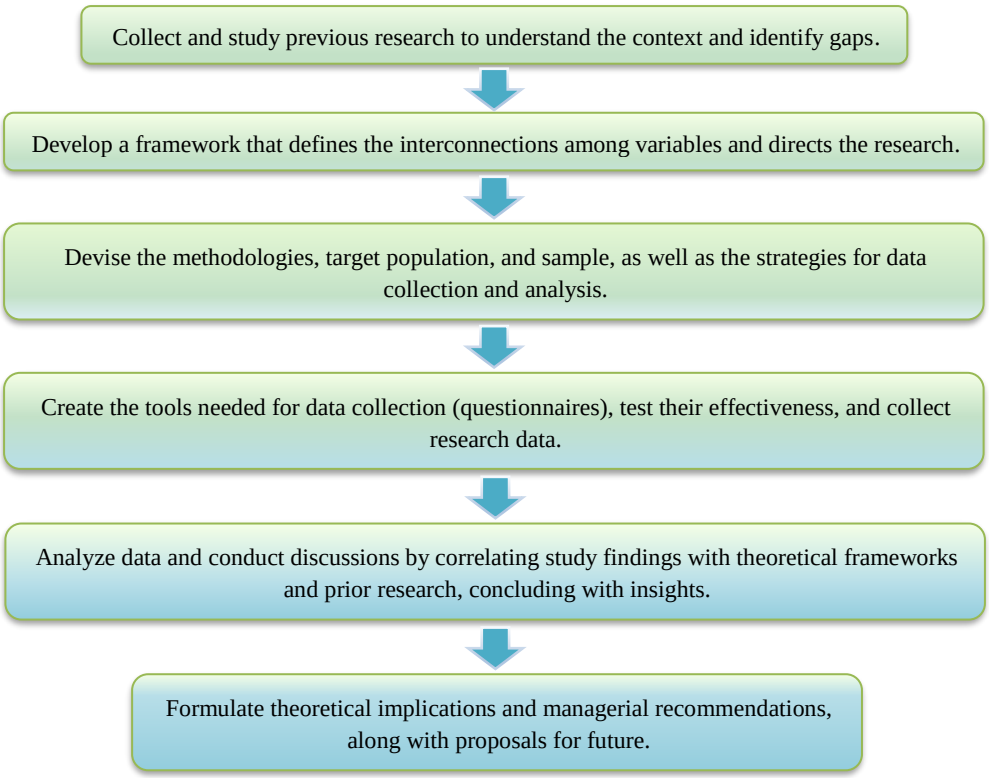


Figure 2. Methodology process

3.1. Questionnaire Design

A multi-item quantitative research questionnaire consisting of a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree) for four variables was employed. As for the dynamic capability variable, a different measurement was used: a seven-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). It was measured using Wilden et al. [72] 's scale. In addition, a 10-item scale from Nkundabanyanga et al. [35] was employed for the innovation variables while the survival of startups, measured by profitability, was adopted from Nkundabanyanga et al. [35] with four items. The final measure, competitive advantage, was measured using Li et al. [73]'s scale, which included two and four questions; Pereira-Moliner et al. [58] used four questions, and Almotawteh [57] used five questions. There was a total of 15 items in the four components. The specific research variables and their measurement items in the questionnaire are presented in Appendix I.

In this research, we examined the quality of the research instrument by assessing its content validity using the Content Validity Index (CVI). We aimed to assess the consistency of the questionnaire items with the definitions of the studied variables, thereby determining their accuracy and comprehensiveness in measuring the intended content. The criterion for the CVI is that it should be 0.8 or higher [74]. This study involved three experts with relevant expertise to review and evaluate the instrument, resulting in a content validity index (CVI) of 0.951, which meets the criterion.

3.2. Data Collection

There were 1,085 Thai startups in the survey. Hair et al.'s [75] criteria were used to select the sample size of 170 companies, which indicate that the sample-to-parameter ratio should be 10:1, 15:1, or 20:1 to be sufficient for Confirmatory Factor Analysis (CFA). There were eleven observable variables discovered. As a result, the sample group must include at least 100—200 startups to enhance the reliability of the evaluation and data analysis.

Structural Equation Modeling (SEM) complicates the establishment of generic standards for sample size needs [76]. Notwithstanding, several rules of thumb have been presented: a hundred or two hundred samples at the very least [77], five or ten observations for each estimated parameter [78], and ten instances for each variable [79]. We determined the sample size by using Cohen's [80] test power of 0.9, an effect size of 0.3, 4 latent variables, and 10 observable variables. We also set the type I error to 0.05. The sample size was 173; nevertheless, there were 170 replies. The SEM typically requires a sample size of 100–150 [81-84]. Consequently, the sample size employed is adequate for the SEM and is representative of the population.

The startup sample size was determined using stratified random sampling. Following systematic sampling, online (Google Forms) and paper surveys (post office) were conducted. As a result, 515 online questionnaires and 462 paper surveys were distributed to the participants. Within two months, 30 online and 20 paper responses were received for the first round. The number of questionnaire replies was lower than expected. The researcher then called to inquire about the progress for startups that had not yet replied. Additional completed questionnaires were collected until enough were gathered in accordance with the strategy. Over a 4-month period, 120 responses (65 postal and 55 online) were received. After data cleaning, the participants in this study were from 170 tech startups in Thailand, indicating a robust representation of the population.

3.3. Data Analysis

CFA was used to validate the measurement tools by considering the chi-square statistic (χ^2= non-significant) relative chi-square (χ^2/df < 2) [85], root mean squared error of approximation (RMSEA < 0.08), comparative fit index (CFI > 0.92), and Tucker Lewis Index (TLI > 0.92). Furthermore, standard root means square residual (SRMR < 0.08) [75, 86], tests were used for data analysis in this study, which tested composite reliability (CR > 0.7), and average variance extracted (AVE > 0.5) [87], a constituent for convergence validity. We applied SEM to study the dynamic capability, innovation, competitive advantage, and survival of tech startups in Thailand. We used the M-plus package to compare the hypothetical model's absolute fit indices with the empirical data, utilizing Hair et al.'s [75] index criteria to gauge the model's harmony.

4. Data Analysis and Results

Among the 170 participants, 59.41% were male. In addition, most of the respondents were between 38 and 47 years old (44.12%). About 34.71% were startup founders. Regarding startup characteristics, about 91.76% had a firm size of less than 50 employees; about 50.59% of firms had a firm age of more than 6 years; and about 62.94% of startups were 'business-market fit', as shown in Figure 3.

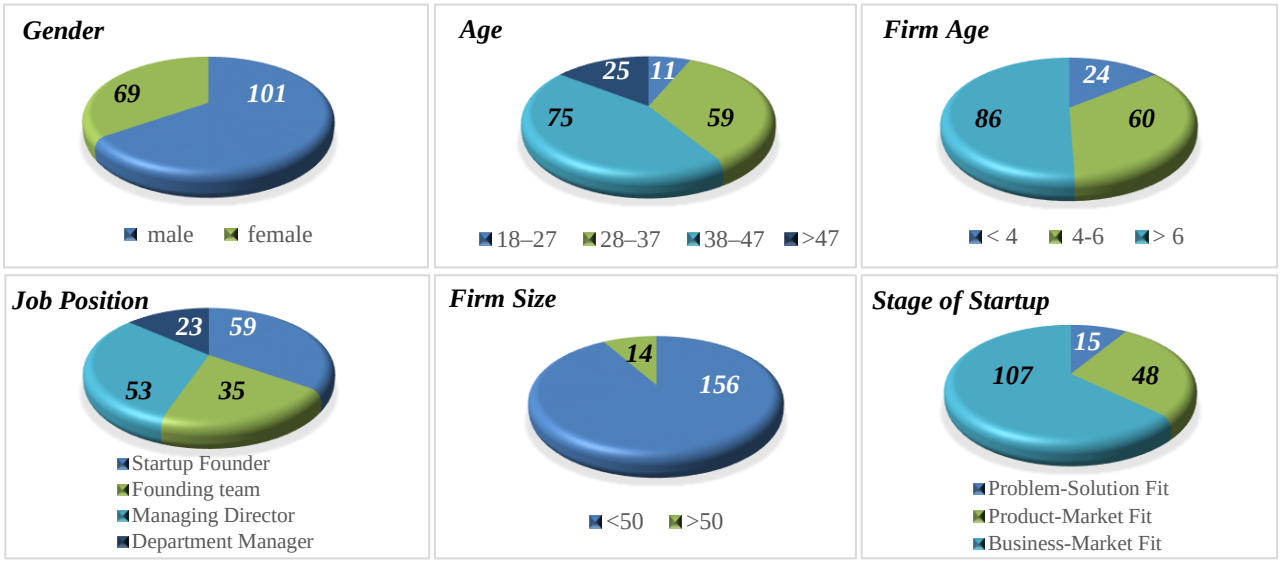


Figure 3. Characteristics of respondents

4.1. Analysis of Common Method Bias

Common method variance (CMV) can be assessed when using surveys to collect data from the same people at the same time. This is especially true when both the dependent and independent variables are perceptual measurements derived from the same respondent. If respondents tend to provide consistent answers to survey items that are otherwise unrelated, self-reported data can produce spurious correlations [88]. As a result, common method variance (CMV) must be investigated. Marker variables were utilized in this study to assess attitudes toward self-indulgent shopping, as well as the relationship between the four questions and the scale produced by Sharma et al. [89]. Following the marker variable test, the variance of the common technique was 0.79% (<50%). The finding was that other factors of the study did not involve relationships between variables in the research model [90]. These results indicate that there is no common variance, which does not impede the results.

4.2. Reliability and Validity Test

The reliability of coefficient Cronbach's alpha values in Table 1 ranged from 0.819 to 0.903, showing that the constructs were internally consistent [91]. Hence, the questionnaire demonstrates reliability in assessing the targeted constructs.

Table 1. Reliability and validity test results of each variable

Variables	Indicators	Factor loading coefficient	CR	AVE	Cronbach's
Survival of Startups	SS	0.935	0.875	0.875	0.819
Dynamic Capability	DCs1	0.681	0.777	0.544	0.889
	DCs2	0.619			
	DCs3	0.885			
Innovation	INO1	0.731	0.757	0.610	0.903
	INO2	0.828			
Competitive Advantage	CA1	0.644	0.803	0.505	0.877
	CA2	0.696			
	CA3	0.720			
	CA4	0.777			

χ^2= 39.137, df = 30, χ^2/df =1.30, p < .01, RMSEA = 0.042, CFI =0.984, TLI = 0.975, SRMR = 0.039.

We employed CFA to investigate the discriminant validity of the following major variables: the survival of startups, dynamic capability, innovation, and competitive advantage. The overall model's chi-square, the comparative fit index (CFI), the Tucker-Lewis Index (TLI), and the root mean square error of approximation (RMSEA) were used to assess model fit, as indicated by Hair et al. [92]. The results showed that the predicted four-factor model fit the data well (χ^2= 39.137, df = 30, p < .01, RMSEA = 0.042, CFI = 0.984, TLI = 0.975, SRMR = 0.039). Although the chi-square test of the hypothesized model proved significant, a relative chi-square (χ^2/df) ratio of less than three has been advocated as an alternate test [75]. The relative χ^2 was 1.30 in this case, demonstrating that the hypothetical model fit the data well, and showed that CFA had a conformance index that followed the criteria.

The factor loadings were satisfactory, ranging from 0.619 to 0.935. The average variance extracted (AVE) values ranged from 0.505 to 0.875 and the composite reliability (CR) of the constructs ranged from 0.757 to 0.875. Both values met the criteria for determining convergence validity [87].

In addition, as shown in Table 2, the means values ranged from 3.952 to 5.836, the standard deviations ranged from 0.420 to 0.622, and the correlation coefficients of the study variables were significant from 0.258 to 0.503. Since there was no correlation coefficient of the variables with a value greater than 0.90, which meets the basic criteria for considering multicollinearity [75], the above variables did not have multicollinearity.

Table 2. Variable correlations coefficients, means and standard deviations

Variables	Mean	S.D.	1	2	3	4
1. Survival of Startups	3.952	0.622	-			
2. Dynamic Capability	5.836	0.526	0.373**	-		
3. Innovation	4.325	0.507	0.400**	0.258**	-	
4. Competitive Advantage	4.178	0.420	0.503**	0.495**	0.364**	-

Note: N = 170, **p < .01.

4.3. Structural Model Testing

Table 3 displays the results of this study, which continues to use Mplus software to examine model fit. To see how well the hypothetical model fit the real-world data, we looked at the relative chi-square/degree of freedom (χ^2/df < 2), the comparative fit index (CFI > 0.92), the Tucker Lewis Index (TLI > 0.92), the root mean squared error of approximation (RMSEA < 0.08), and the standard root means square residual (SRMR < 0.08). The Structural Equation Model (SEM) results showed that the predicted model fit the data well (χ^2= 39.137, df = 30, χ^2/df =1.30, p < .01, RMSEA = 0.042, CFI =0.984, TLI = 0.975, SRMR = 0.039). When CFA was performed, structural validity was found when the fit indices met the criteria without any model adjustments.

Table 3. Model fit

Variables	χ^2/df	CFI	TLI	RMSEA	SRMR
Allowable range	1<χ^2/df<2	>0.92	>0.92	<0.08	<0.08
Study model fit	1.30	0.984	0.975	0.032	0.042

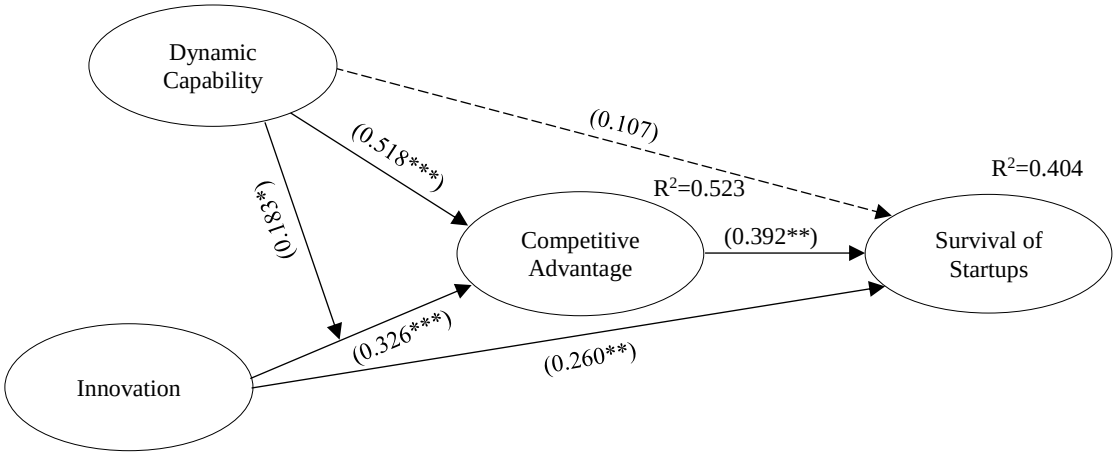
4.4. Hypothesis Testing Results

Figure 4 presents the results of the structural model test. Furthermore, the analytical data supports seven out of the eight hypotheses, as shown in Tables 4 and 5.

Table 4. Hypothesis testing results

Hypotheses	Relationships	β	S.E.	Z	p-value	Results
H1	DCs ⇒ SS (+)	0.107	0.107	0.997	0.319	rejected
H2	INO ⇒ SS (+)	0.260	0.093	2.799	0.005	supported
H3	DCs ⇒ CA (+)	0.518	0.076	6.830	0.000	supported
H4	INO ⇒ CA (+)	0.326	0.089	3.675	0.000	supported
H5	CA ⇒ SS (+)	0.392	0.119	3.301	0.002	supported

Note: n =170, SS = Survival of Startups, DCs = Dynamic Capability, INO = Innovation, CA = Competitive Advantage,



Note: Significance ***p < .001, **p < .01, * p <.05

Figure 4. Structural model test results with standardized coefficients

The research found no statistically significant direct effect of dynamic capability on startup survival. Dynamic capability indirectly influences the survival of startups by conferring a statistically meaningful competitive advantage. As shown in Table 4, the path of dynamic capabilities on the survival of startups was not significant (β = 0.107, p = 0.319), rejecting H1.

However, innovation significantly and positively affected the survival of startups (β = 0.260, p = 0.005). The results are in accordance with the hypothesis. Therefore, hypothesis H2 is accepted.

The path from dynamic capabilities significantly positively affected competitive advantage (β = 0.518, p = 0.000), supporting H3.

Innovation positively influenced the survival of startups, as evidenced by (β = 0.326, p = 0.000). The results align with the theory. Consequently, hypothesis H4 is accepted.

Finally, competitive advantage was found to have a positive effect on the survival of startups (β = 0.392, p = 0.002). H5 is therefore supported.

4.5. Mediating Effect Test and Moderating Effect Test

Table 5 displays the results of this study's continued analysis of the mediating effect of competitive advantage in Mplus software. In the "DCs⇒ CA⇒ SS" path, the point estimate of the mediating effect of competitive advantage was 0.213 (p <.01), indicating that competitive advantage is a mediator between dynamic capability and startup survival. The results are in accordance with the hypothesis. Therefore, hypothesis H6 is accepted. The lack of statistical significance indicates that dynamic capabilities did not directly impact survival. This makes competitive advantage a full mediator between dynamic capability and startup survival.

For H7, the "INO ⇒ CA ⇒ SS" path, the point estimate of the mediating effect of competitive advantage was 0.116 (p <.05), indicating that competitive advantage had a significant mediating role between innovation and the survival of startups. Consequently, H7 was supported.

Finally, we assessed dynamic capabilities as a moderating variable to analyze their impact on the relationship between innovation and competitive advantage. The moderating effect of "DCs* INO ⇒ CA" was 0.183 (p < 0.05), indicating the presence of a moderating effect. Therefore, dynamic capabilities positively moderate the relationship between innovation and competitive advantage. The results are in accordance with the hypothesis. Therefore, hypothesis H8 is accepted. The R2 values for competitive advantage and the survival of startups were found to be 0.523 and 0.404, respectively.

Table 5. Analysis of Mediating Effect Test and Moderating Effect Test

		R^2	Effect Coefficient	Mediated Effects		Moderated Effects
				Dynamic Capabilities	Innovation	
Dependent Variables	Competitive Advantage	0.523	Direct Effect	0.518***	0.326***	0.183*
			Indirect Effect	-	-	
			Total Effect	0.518***	0.326***	
	Survival of Startups	0.404	Direct Effect	0.112	0.254**	
			Indirect Effect	0.213**	0.116*	
			Total Effect	0.325***	0.370***	
Relationships				DCs ⇒ CA ⇒ SS	INO ⇒ CA ⇒ SS	DCs* INO ⇒ CA
Hypotheses				H6	H7	H8
Results				supported	supported	supported

SS = Survival of Startups, DCs = Dynamic Capability, INO = Innovation, CA = Competitive Advantage, ***=p < 0.001, **=p < 0.01, *=p < 0.05

5. Discussion and Implications

According to Barney's [13] definition of the resource-based theory, dynamic capabilities are intangible resources that are valuable, rare, hard to copy, and cannot be replaced. They give a business a competitive edge. This research revealed that dynamic capabilities have a positive effect on competitive advantage. This is consistent with most studies; Correia, Dias, & Teixeira [61] found that competitive advantage also mediates the association between dynamic capabilities and performance. Kuo et al. [7] discovered that a company's dynamic capabilities impact its competitive advantage, which aligns with the findings of Ogunkoya et al. [66], Li & Liu [93], and Chukwuemeka & Onuoha [6]. These findings suggest that company managers should foster a swift response to environmental changes by enhancing employees' abilities to detect, monitor, and respond to competition. This aligns with the findings of Fainshmidt & Frazier [94], which indicate that the capacity to reconfigure, an element of dynamic capacities, positively influences competitive advantage. However, dynamic capabilities do not affect the survival of startups. However, upon testing its role as a mediating variable of competitive advantage, resource-based theory revealed that dynamic capabilities influence the survival of startups by acting as an interstitial variable of competitive advantage. Since dynamic capabilities are strategic and different from general capabilities, firms can maintain and expand their competitive advantage by layering them on top of general capabilities [95]. This research also includes important findings on dynamic capabilities that support the relationship between innovation and competitive advantage.

This research found both direct and indirect relationships between innovation and startup survival. We found that innovation positively impacts survival, in line with previous research [10, 35], and it indirectly influences survival. through competitive advantage. It also has a direct effect on competitive advantage, which is consistent with previous studies. Ortiz-Villajos & Sotoca [96] discovered that substantial innovations, particularly novel processes, exert a favourable influence on the survival trajectories of enterprises. Moreover, augmenting the volume of patent applications elevates the probability of endurance for manufacturing-centric enterprises. This corresponds with the findings of Zhang, Zheng, & Ning [97], who demonstrated that innovation, as quantified by patents, can enhance a company's survival rate. Moreover, Afraz et al. [98] discovered that innovation is crucial for attaining competitive advantage, aligning with the findings of Farida & Setiawan [99], which emphasize the significance of efficiency and innovation in enhancing competitive advantage. It is advised that businesses improve their performance and innovation abilities to bolster their competitive advantage, akin to the conclusions of Suoniemi et al. [100] which indicate that the implementation of organizational innovation results in organizational success and fosters a competitive edge. Consequently, firms must dedicate themselves to cultivating innovation and consistently prioritize its development across all domains. Innovation is deemed essential for establishing a competitive advantage, especially for small and medium-sized firms [101]. This aligns with the findings of Nimsith et al. [102], which indicate that entrepreneurs' capacity to execute innovation results in business operations capable of generating a competitive advantage. The resource-based view of the firm suggests that startups with unique, innovative capabilities can leverage these resources to establish barriers to entry, making it difficult for competitors to replicate their success [13]. Consequently, startups that prioritize innovation are more likely to develop and maintain a competitive advantage, which in turn increases their likelihood of survival in the long term.

5.1. Implications

Rooted in the Resource-Based View (RBV), the foundation of competitive advantage and survival lies in possessing resources that are intangible and superior to others [13]. This research highlights that, for startups in Thailand, key resources contributing to competitive advantage include dynamic capability and innovation. These resources impact survival both directly and indirectly, demonstrating their critical role in helping companies adapt to challenging situations. By integrating superior resources to create differentiation, companies can respond effectively to market volatility, maintaining their competitive edge and ensuring long-term survival. The research underscores the importance of internal resources, especially intangible assets, as crucial drivers of competitive advantage and survival, even in the

face of adversity such as the COVID-19 pandemic. The findings reveal that in the context of Thailand, these internal resources are integral to the resilience and survival of startups.

Our study provides valuable insights into how startups can enhance their competitiveness and improve their chances of survival. The findings reveal that dynamic capabilities and innovation positively impact competitive advantage, which in turn is positively correlated with the survival of startups. Therefore, for startups aiming to survive in a competitive market, it is crucial to build and leverage their competitive advantage by enhancing their dynamic capabilities. This can be achieved by actively participating in startup-related activities, which provide opportunities for greater visibility. Engaging in pitching events, for instance, allows startups to promote themselves more effectively. While dynamic capabilities do not directly affect survival, they indirectly influence it through competitive advantage, acting as a mediating variable. This suggests that startups need to harness their dynamic capabilities by continuously sensing, seizing, and adapting through their involvement in various industry platforms designed to foster startup growth. Moreover, startups must strive to cultivate an atmosphere that actively fosters innovation within the organization. By encouraging the development of new ideas and promoting a culture of creativity, startups can generate comprehensive and integrated innovations. When startups build on their existing strengths and continuously present innovative solutions, they not only gain a competitive advantage, but also enhance their chances of survival in the market. Innovation becomes a driving force that propels the organization forward, ensuring that it remains competitive and resilient in a rapidly evolving business environment. Finally, if startups want to connect innovation and competitive advantage more tightly, they can do so through dynamic capabilities. This involves enhancing the organization's ability to identify and recognize opportunities arising from environmental changes, improving the capacity to absorb and leverage new knowledge to exploit these opportunities effectively, and reconfiguring resources to align with environmental shifts. Emphasizing the importance of fostering innovation and developing new capabilities within the organization are crucial to ensuring agility and responsiveness to changing conditions.

6. Conclusions, Limitations and Future Research

This study integrates resource-based view theory (RBV) with dynamic capabilities theory to link intangible internal resources that influence survival in the constantly evolving context of the COVID-19 pandemic. The Resource-Based View (RBV) emphasizes internal resources that provide competitive advantage, enabling businesses to enhance their competitiveness and improve their survival prospects. The dynamic capabilities hypothesis elucidates the organizational competencies that enable entities to endure in swiftly evolving settings. The RBV interconnects with dynamic capabilities. The dynamic capacity hypothesis emphasizes the significance of the environmental setting in which the firm operates, while emphasizing the company's internal operations and resources.

Dynamic capacities and innovation are essential catalysts for competitive advantage in startups. Innovation enables companies to generate distinctive value and distinguish themselves from rivals, while dynamic capabilities guarantee the effective implementation and scaling of these breakthroughs in a swiftly evolving landscape. Dynamic capabilities serve as a moderating variable, amplifying the influence of innovation on competitive advantage, so rendering them essential for the sustained viability of companies. Startups that focus on cultivating innovation and dynamic capabilities are more adept at managing market uncertainty and attaining sustained growth. This research highlights the necessity for companies to cultivate dynamic capabilities within their strategic management practices to succeed in contemporary, rapidly evolving, and innovation-centric marketplaces.

The methodological shortcomings of this work limit its potential contributions. Its cross-sectional design makes it difficult to determine strong causality. Perhaps a long-term study would improve reliability. Additionally, rather than using more comprehensive real data, the results are based on information gathered from key respondents. Consequently, other factors influencing startups' ability to survive should be the focus of future research. One way to evaluate the approach would be to add moderators, such as leadership. Relevant outcomes that could be examined include psychological empowerment, market orientation, R&D and external support. In addition, we focus on startups in Thailand. Other industries and locations could be the subject of future research, which would facilitate further comparison. The research findings may be valuable for future studies, may be beneficial to startups, academics, practitioners, and policymakers, and can contribute to future research as a source of reference.

7. Declarations

7.1. Author Contributions

Conceptualization, P.D. and I.R.; methodology, P.D. and I.R.; software, P.D.; validation, P.D. and I.R.; formal analysis, P.D.; investigation, P.D.; writing—original draft preparation, P.D. and I.R.; writing—review and editing, P.D. and I.R.; visualization, P.D.; supervision, I.R. All authors have read and agreed to the published version of the manuscript.

7.2. Data Availability Statement

The data presented in this study are available in the article.

7.3. Funding

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7.4. Institutional Review Board Statement

Not applicable.

7.5. Informed Consent Statement

Not applicable.

7.6. Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix I: Questionnaire Items

Variables	Indicators	Variables	Reference
Survival of Startups	SS	1. We continuously evaluate our procedures to reduce operational flaws. 2. The profits of our organization have continuously grown year over year. 3. Over the years, our organization has seen a decline in sales revenue. 4. We have maintained a constant selling price for our products and services across the years	[22]
Dynamic Capability	DCs1	1. Individuals in my organization engage in professional association activities. 2. We employ recognized methodologies to ascertain: (1) target market segmentation, (2) evolving client requirements, and (3) customer-driven innovation. 3. We adhere to exemplary practices within our industry. 4. We collect economic data regarding our operations and operational context.	[55]
	DCs 2	1. We prioritize discovering solutions for our clients. 2. We implement the optimal methods within our industry. 3. We address defects identified by employees. 4. We modify our methods in response to client input that necessitates modification.	
	DCs 3	1. We consistently adopt innovative management techniques. 2. We regularly alter our marketing approach or plan. 3. We significantly revamp corporate processes. 4. We consistently and significantly innovate our methods for attaining our goals and objectives.	
Innovation	INO1	1. Our institution possesses a comprehensive IT department. 2. Our institution utilizes software for reporting purposes. 3. Certain processes are conducted manually. 4. This institution modifies the reporting software system after a designated interval. 5. Our clientele perceives our products and services as user-friendly. 6. We utilize cutting-edge equipment in our operational methods.	[22]
	INO2	1. We possess a recognized trademark that represents our products and services. 2. Our company is a member of a group that upholds copyright legislation in Thailand. 3. Our clientele readily identifies with our registered trademark. 4. The majority of customers recognize our registered products.	
Competitive Advantage	CA1	1. We provide competitive pricing. 2. We can provide prices that are equal to or lower than those of our competitors.	[43, 44]
	CA2	1. We can compete based on quality. 2. We provide products that are exceptionally dependable. 3. We provide products that are highly durable. 4. We provide superior-quality products to our clientele.	
	CA3	1. A brand image identifies the firm. 2. The quality of service provided surpasses that of competitors. 3. A larger array of extra services is provided to enhance consumer value. 4. The service implements significant advancements.	
	CA4	1. Employees have the authority to take any necessary actions to ensure client satisfaction. 2. We commit all internal operations to delivering enhanced value to customers. 3. Employees are instructed to fulfil the requirements and preferences of clients regardless of cost. 4. Employees have the authority to act quickly to meet client needs. 5. All personnel engage directly with clients to assess their satisfaction levels.	