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Original Research

Technological Development and Competitive Advantage: Driving Sustainable Performance in Culinary Startups.

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Abstract: *Technological advancements have intensified market competition, particularly in the culinary startup sector, where in Indonesia only 90% of startups are able to survive. This situation highlights the need for efforts to maintain and enhance sustainable performance, which can be influenced by technological capabilities and the competitive advantages possessed by the company. This study aims to examine the direct and indirect effects of Technological Capability (TC) on Sustainable Performance (SP), with Sustainable Competitive Advantage (SCA) as a mediating variable, and also investigates the moderating role of SCA in the relationship between TC and SP. The research uses Structural Equation Modeling-Partial Least Squares (SEM-PLS) and is based on data from 220 culinary startups in Batam City. The findings reveal that both TC and SCA have a direct effect on SP, and that SCA mediates the relationship between TC and SP. However, no moderating effect of SCA was found. This study is limited to culinary startups in Batam and focuses solely on the influence of TC and SCA on SP. Future research is encouraged to expand the scope to other regions such as the Riau Islands or Indonesia more broadly, and to consider additional variables such as innovation capability and absorptive capacity for a more comprehensive understanding of the factors influencing sustainable performance.*

Keywords: *Culinary Startup, Sustainable Competitive Advantage, Sustainable Performance, Technological Capability.*

I. INTRODUCTION

Indonesia's economic growth in recent years has been driven by the rapid growth of the startup ecosystem (Siahaan, 2024). Startups are companies formed by individuals or groups to develop unique products or services according to market needs (Shiba, 2024). The growth of startups in Indonesia can be stated quite rapidly, Indonesia occupies the sixth position with a total of 2,692 startups globally based on December 2024 data (Jatmiko, 2024). Indonesia is also the country with the highest number of startups in the ASEAN region and outperforms Singapore, with 2,593 startups based on data as of February 2024 (Marietha, 2024). Startup businesses in Indonesia are dominated by micro-scale startups at as much as 48.1%, followed by small-scale startups at 28.2%, medium scale at 18.5%, and large-scale at 5.2% (Tia, 2022).

Startups in the culinary field are a type of startup business that is mushrooming in Indonesia, apart from digital startups. Culinary startups are a promising type of business, because they provide basic human needs, namely food and drinks, and can become a lifestyle for the community, so startups in the culinary field have business opportunities and a wide market share (Anggani, 2022). Seeing the opportunities and business potential in this field, the Ministry of Tourism and Creative Economy encourages young culinary entrepreneurs to become culinary startups. This effort is supported by the implementation of the FoodStartup Indonesia (FSI) program. This program shows a lot of interest from culinary business actors to transform their culinary businesses into culinary startups, with a total of 6,499 registered participants (Sofia, 2020).

Culinary startups not only show great potential but also contribute and play an important role in the economy and community empowerment, which is the reason for efforts to support the growth of culinary startups in Indonesia (Kemenparekraf, 2021). This is related to the contribution of culinary businesses to the development of the Indonesian economy, it was noted that businesses in the culinary industry had a Gross Domestic Growth (GDP) rate of 5.33% year-on-year (YoY) in the first quarter of 2023, this figure is higher than the national GDP rate of only 5.03% YoY. Businesses in the culinary field are also drivers of national consumption GDP, national consumption contributes to Indonesia's economic development by 43%, which shows the indirect influence of culinary businesses (Fahmi, 2024).

Startups or businesses in the culinary field are also found to contribute to economic empowerment and create community jobs (Utomo et al., 2020). Businesses in the culinary field are projected in 2024-2029 to increase in employment from 676.9 thousand people to 1 million people, with an average growth of 76.3 thousand people (9.36%) per year, while for

culinary businesses in the Riau Islands region it is projected to be able to absorb 5,733 workers in 2024-2029 with an average of 496 people (7.45%) per year (KEMNAKER RI, 2024).

The digital era has made the development of startup businesses in Indonesia more rapid, such as the development and advancement of technology, but not many startups are able to survive or make a profit (Shiba, 2024). This increase in the growth of the number of startups has led to higher market competition, this has caused many large startups to experience bankruptcy, as well as a decline in performance which has caused many startups to lay off in 2023. For example, GoTo (Gojek Tokopedia) laid off 1,300 (12%) of their permanent employees, Fabelio, an interior design service startup, went bankrupt (Azura, 2023). About 90% of startup businesses in Indonesia were found to fail to sustain their business in the early years of operation (Winosa, 2019). These matters become the urgency of this research.

The lack of adaptation of startup businesses is one of the causes of startup failure, startup business actors must be able to adapt quickly in order to keep up with market changes and face technological changes (Bahar, 2024). Adaptation is one of the challenges, especially for small startups that are just starting a business (Sabrina, 2024). Another reason is not being able to compete, as the number of startup businesses grows every year, the competition for startup businesses is tight. This is because the lack of differentiation of their products or services is the reason why startups are unable to compete (Hendrayati, 2025). This exposure shows the important role of technology and competitive advantage to maintain their business in the long term (Haseeb et al., 2019).

Research by Salisu and Abu Bakar (2020) shows that technological adaptation in a business must be supported by high TC so that it can encourage SP. Research by Fegada and Veres (2024); Valdez-Juárez and Castillo-Vergara (2021) also found TC can improve the SP of a business and become an important factor. Apart from affecting SP, technological is also found to affect the SCA of a business (Liu & Yang, 2021). TC can help companies' efforts to innovate and formulate management strategies and operational efficiency that can become their advantages, which in turn can improve the SP of the business (Rahim & Zainuddin, 2019).

Other studies also find the effect of TC on MSMEs in Indonesia, such as research by Anggadwita et al. (2021) which found the effect of TC on the performance of MSMEs in Bandar Lampung. Research by E. R. Lestari and Ardianti (2019) also found that TC can support business success in MSMEs in Batu City, Indonesia. Research by Sushandoyo et al. (2022) also stated that various types of variations from TC can help improve the performance of technology startups in Indonesia. Research by Satar et al. (2025) found that the adaptation of technology can help in efforts to create SCA in companies in Indonesia.

Another study also found the influence of TC and SCA on the performance of a business in the Batam City area. Previous research by Cuandra and Candy (2024) found that TC can help efforts to improve the performance of micro-enterprises in the culinary field in Batam City. Similar findings in the research of Husna et al. (2024) also show that the TC of the information technology type can also help culinary MSMEs in Batam City improve their business performance. Another study by Venny and Febriyantoro (2020) found that the performance of culinary MSMEs in Batam City can be influenced by competitive advantage. Although there are several studies that have tested the influencing factors of culinary business performance in Batam City, there has been no research that specifically analyzes the influence of these factors on the SP of culinary businesses in the form of startups. Therefore, this study aims to fill the research gap through this study.

Based on the presentation and review of information, as well as research related to factors that influence SP, it can be identified that TC and SCA are factors that affect the SP of a business. This study adopts the underpinning theory of competition and entrepreneurship by Kirzner (1973), which found the concept of entrepreneurship based on the role of entrepreneurs in finding market opportunities. This study presents novelty by examining the influence of TC on SP in the culinary startup sector by considering the mediation and moderation roles of SCA. Unlike previous studies that focused more on the direct relationship between these factors, this study emphasizes the importance of SCA as a link that can modify or strengthen the impact of TC on SP. By adopting the competitive and entrepreneurship framework by Kirzner (1973), this study adds a new perspective to understanding how TC not only improves its performance but also strengthens SCA in an increasingly competitive market. The findings of this study are expected to provide meaningful insights for business owners, academics, and policymakers in the culinary startup sector, as well as encourage the development of more effective innovative strategies in the culinary industry. The findings of this study also can help culinary industry businesses to optimally utilize technology and build sustainable competitive advantages to increase operational efficiency, competitiveness, and the sustainability of their businesses.

II. LITERATURE REVIEW

This study aims to analyze the influence and relationship of factors that are considered to be able to influence the SP of culinary startups. These factors are TC and SCA. This study will also test the impact of mediation and moderation by SCA on the relationship of these influences. This study raises the underpinning theory of competitive and entrepreneurship by Kirzner

(1973) to assist in the assessment and analysis of the results of this study. The theory of competitive and entrepreneurship by Kirzner (1973) focuses on the role of entrepreneurs in the market and how they contribute to the dynamics of competition. According to Kirzner, entrepreneurs act as agents who identify untapped market opportunities and bring innovation to take advantage of these opportunities. Kirzner emphasized that entrepreneurship focuses more on being aware of opportunities in the market, rather than simply creating new ideas or innovations.

There are several previous studies that support the hypothesis of this study, that stated TC effect SP, such as Darmawan et al. (2023); Djiu et al. (2024); Fegada and Veres (2024). Research by Cuandra and Candy (2024) found that SME performance can be influenced by business model innovation, competitive advantage, TC, learning capability and relational capability. This research was conducted on 210 MSMEs in Batam City. This study also found a mediating impact of learning capability on the indirect effect of TC and relational capability on SP. Research by Autio et al. (2024) tested the influence of adoption of digital technology and business model innovation on startup SP. The theoretical model was tested using a questionnaire interview survey on a total of 685 digital startups in six ASEAN countries (Indonesia, Malaysia, Philippines, Singapore, Thailand & Vietnam). This study found that digital technology adoption and the effectiveness of business model innovation can improve SP financial.

Research by Djiu et al. (2024) analyzed the influence of TC and social media on the export performance of MSMEs engaged in the clothing business. This study was conducted on 138 MSMEs selling clothing in Indonesia, this study found that TC directly affect export performance, while the use of social media does not. This study also found that mediation from SCA can help the influence of TC and social media on the export performance of MSMEs.

Tufan and Mert (2023) conducted a study that analyzed the influence of absorptive capability, strategic agility, SCA and SP. This research was conducted on 421 family business-oriented MSMEs in Turkey. The results of this study found the influence of absorptive capability, strategic agility and SCA on SP, as well as the mediating effect of SCA on the relationship between strategic agility and SP. There is also several research stated SCA affected SP, such as Elgarhy and Abou-Shouk (2023); Saputra et al. (2023); Tufan and Mert (2023). Çağlıyan et al. (2022) also conducted a study that analyzed the mediating effect of SCA on the effect of organizational innovativeness on firm performance. This study surveyed 264 respondents who were companies located in Konya, Turkey. The results of the research analysis found that organizational innovativeness significantly positively affects SCA and firm performance. Also, SCA has a mediating impact on the relationship between organizational innovativeness and firm performance. Salisu and Abu Bakar (2020) through their research also found that TC and relational capability positively affect the performance of MSMEs. And there is a mediating impact by learning capability on this influence. This research data was obtained through a survey of 370 managers of manufacturing MSMEs in Africa. The results of this study also identified a mediating impact by learning capability, but learning capability does not affect MSME performance directly.

Kim et al. (2020) found the effect of knowledge management activities, quality management and competitive intelligence activities on business performance. This study also examines the mediating impact of technology commercialization capability and SCA. Research survey on 409 companies for one month in Switzerland. Through this study, quality management activities and competitive intelligence activities have a significant positive effect on technology commercialization capability and quality management activities. competitive intelligence activities, and technology commercialization capabilities have a significant positive effect on SCA. In addition, SCA has a significant positive effect on business performance. S. D. Lestari et al. (2020) conducted research on business innovation models and MSME performance through mediation by competitive advantage. The research data was obtained from a questionnaire distributed to 497 respondents who joined using the Gofood application in Makassar City. The results of this study indicate the direct and indirect effects of business model innovation on MSME performance, as well as the direct and mediating effects of competitive advantage on MSME performance.

Other research by Haseeb et al. (2019) also examined the influence of social responsibility, value and belief on SCA and the indirect effect on sustainable business performance. Testing this effect also adds a mediating effect by the strategic alignment factor. The research data tested was collected using a questionnaire with a total of 190 company managers in Malaysia. This study found a positive and significant effect of social responsibility, values and beliefs and technology on competitive advantage. As well as the positive influence of competitive advantage on sustainable business performance.

A) TC and SP

TC is important in managing innovation and business development. This includes the use of company resources to drive innovation processes and operational system efficiency that supports technological change and development (Medeiros Vila Nova & Bitencourt, 2020). Lestari and Ardianti (2019) argue that TC has an impact on company performance. Companies that already have TC tend to have higher performance. TC includes practical and theoretical knowledge that enables companies to

improve and develop new products. New technology has an important impact on the innovation process in MSMEs. Technology also makes it easier for MSMEs to meet consumer needs, by providing information related to these factors, then resulting in better financial performance (Valdez-Juárez & Castillo-Vergara, 2021). TC can help companies find and apply new external knowledge that can support increased competence and produce better performance (Ahmad et al., 2019). Through this study, it can be hypothesized that TC has a positive and significant effect on SP. This hypothesis is supported by previous research by Fegada and Veres (2024); Djiu et al. (2024); Md Hassan and Ibrahim (2022); Salisu and Abu Bakar (2020); Valdez-Juárez and Castillo-Vergara (2021).

H1: TC has a positive and significant effect on SP.

B) SCA and SP

SCA is a company's long-term competitive advantage. This advantage is obtained from a unique business strategy, product or service differentiation, or based on the ability to develop resources that are responsive to market needs. This competitive advantage can determine the company's position in the market competition, as well as its level of profitability (Madhavan et al., 2022). Competitive advantage has a significant impact on business performance because it allows companies to win the competition through efficiency, and resource stability, and helps companies overcome market barriers and the power of suppliers and buyers. This advantage supports companies in making accurate decisions and maintaining their position in the market, which can ultimately improve long-term performance and success (S. D. Lestari et al., 2020). Competitive advantage comes from the ability of MSMEs to utilize internal strengths to respond to external opportunities while minimizing internal weaknesses. This advantage is created through various activities carried out by MSMEs in designing, producing, marketing, and distributing their products. Developing a business's competitive advantage requires speed and flexibility, not only focusing on MSME profitability (Yusuf et al., 2023). A startup's competitive advantage can be created and improved through the integration of internal and external resources. External resources such as government policies that provide grants, tax incentives, and funding, as well as support from the startup community that allows the sharing of experiences and knowledge, can help increase startup success. Companies that can develop various resources and capabilities to generate competitive advantages enable the development and improvement of company performance both in the short and long term (Hendi et al., 2022). Through this study, it can be hypothesized that SCA has a positive and significant effect on SP. This hypothesis is supported by previous research by Pumiviset and Suttipun (2024); Tufan and Mert (2023); Çağlıyan et al. (2022); Madhavan et al. (2022); Hussain et al. (2020); Kim et al. (2020).

H2: SCA has a positive and significant effect on SP.

C) TC and SCA

Technology is essential in increasing consumer purchasing power and providing competitive advantages to business actors. The use of digital platforms such as social media and e-commerce is one way to adopt technology. Effective application of technology allows companies to face competition better and strengthen their position in the market share (Amesho et al., 2022). Fegada and Veres (2024) argue that TC has a significant effect on SCA. Companies that have a high level of TC tend to be easier to integrate knowledge from external sources, which can open greater opportunities to create innovative products. TC can be considered an essential strategic resource because it can help companies achieve a higher competitive advantage compared to competitors in their industry. Superior TC increases the efficiency of the product innovation process, so that it can create differentiation and the right response to market needs, this becomes the competitive advantage of the business (Nwodo et al., 2024). The ability to understand and apply technology in each company also varies, this depends on their absorption capacity. This difference becomes the innovation that makes the company superior compared to other competitors (Purwianti, 2021). Through this study, it can be hypothesized that TC has a positive and significant effect on SCA. This hypothesis is supported by previous research by Djiu et al. (2024); Nwodo et al. (2024); Çelik and Uzunçarşılı (2023); Tong et al. (2022); Feng et al. (2020).

H3: TC has a positive and significant effect on SCA.

D) TC and SP through Mediating SCA

The ability to change and utilize technology is the key to the success and sustainability of a company. The ability to change and utilize technology effectively can help companies in their efforts to meet market share needs, which is the company's advantage. This capability can improve business performance (Kim et al., 2020). Çelik and Uzunçarşılı (2023) argue that innovation in TC can create a company's competitive advantage and improve their performance.

Nurjanah et al. (2023) also found that sustainable excellence can help connect the dynamic capabilities possessed by an organization to improve its sustainable performance. This capability can help expand market share, increase the company's ability to innovate and develop new, more competitive products. TC has also been found to improve the company's shipping or export performance. This can help companies in their efforts to meet consumer needs and expand market share, which can increase competitive advantage and drive company performance (Djiu et al., 2024). Although there are previous studies that

have tested factors related to technology, competitive advantage and company performance, there has still been no specific test of the effect of TC through SCA on SP. This study hypothesizes that TC has a positive and significant effect on SP through the mediation of SCA. This hypothesis is the novelty of this study.

H4: TC has a positive and significant effect on SP through the mediation of SCA.

E) TC and SP with Moderating SCA

Company's performance can be supported and influenced by the TC of the company (Djiu et al., 2024; Fegada & Veres, 2024; Salisu & Abu Bakar, 2020; Valdez-Juárez & Castillo-Vergara, 2021). Company performance is also found to be driven by the competitive advantage of the company, which can maintain its position and expand the company's market share (Fegada & Veres, 2024; Madhavan et al., 2022; Kim et al., 2020). The company's competitive advantage is found to be created through the role of TC and the ability to innovate the technology (Liu & Yang, 2021; Feng et al., 2020). In addition, technological innovation capabilities are also found to play an important role in improving company performance which is assisted by the mediation of competitive advantage (Çelik & Uzunçarşılı, 2023). Although there have been many studies analyzing the influence of TC, competitive advantage, and firm performance, there has been no research that specifically analyzes the influence of TC on SP with the role of moderation by SCA. This study hypothesizes that SCA moderates the positive and significant influence of TC on SP. The moderating influence of SCA can strengthen or weaken the relationship between TC and SP. This hypothesis is the novelty of this study.

H5: SCA positively and significantly moderates the influence of TC on SP.

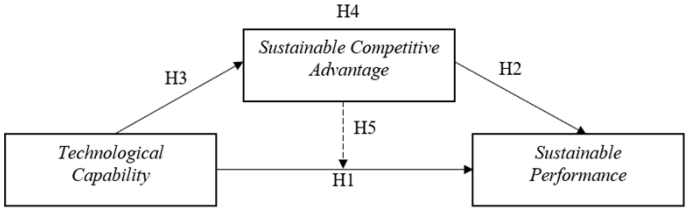

Figure 1: Research Model

III. METHOD

A) Research Design

This research is a quantitative study with a survey research approach using the cross-sectional method. Quantitative research is an objective research approach through statistical testing methods (Hermawan & Yusran, 2017). Quantitative research methodology utilizes numerical data to analyze information related to the research questions to be answered (Abduh et al., 2022). Cross-sectional is used to measure or observe latent variables in a research model simultaneously over a certain period (Ghozali, 2018).

B) Research Objects and Data Collection

The population to be tested in this study is a startup engaged in the culinary field in Batam City. The number of research samples is determined using the theory of Hair et al. (2010) 1:10, by multiplying the number of research indicators to determine the number of samples whose research objects cannot be ascertained by the population. This study has a total of 22 variable indicators, so the minimum number of samples in this study is 220 samples. Data collection for the study used a questionnaire with a Likert scale (1-5). The selection of research respondents used purposive sampling with the provision that research respondents are business owners of startups engaged in the culinary field and have been operating for more than 3 years. The distribution of questionnaires was carried out randomly using a Google form that was shared online. The characteristics of the respondents in this study are divided into several groups. Based on gender, age, last education of the respondents and the amount of gross turnover per month. The following is the percentage of respondents in this study based on characteristics.

Table 1: Demographic Respondents

Characteristic	Quantity	Percentage
Gender		
Male	131	59.5%
Female	89	40.5%
Age		
Less than 18 years old	7	3.2%
18-29 years old	71	32.3%
30-40 years old	78	35.5%
41-50 years old	62	28.2%

More than 50 years old	2	0.9%
Education		
Senior High school	119	54.1%
Diploma	87	39.5%
Bachelor	14	6.4%
Master	0	0%
Gross Monthly Revenue (IDR)		
Less than 30 million	98	44.5%
30-40 million	118	53.6%
40-50 million	4	1.8%
More than 50 million	0	0%
Total	**220**	**100%**

The majority of respondents in this study were male as many as 131 (59.5%), aged 18-29 years old as many as 78 (35.5%), had a senior high school education level as many as 119 (54.1%) and gross monthly revenue of 30-40 million as many as 118 (53.6%).

C) Variable and Measurement

a. Technological Capability (TC)

TC is the ability of a company to perform technical functions such as developing new products and processes, which increase organizational efficiency (Owuori et al., 2020). TC can also be interpreted as an opportunity that allows the adoption and development of various technologies such as technology development, product development, manufacturing processes, and technology prediction (Djiu et al., 2024). TC is a strategic resource that is important in acquiring and combining new knowledge to produce innovative products. It also includes the development of supporting capabilities for the production and distribution of these products (Nwodo et al., 2024). Through TC, companies can gain a competitive advantage in the industry and enable companies to develop and deliver valuable products or services to consumers that positively improve performance (Owuori et al., 2020). Development and investment in TC can increase efficiency in implementing new technologies (Medeiros Vila Nova & Bitencourt, 2020). TC acts as an independent variable in this study. Independent variables are free variables that affect dependent variables (Indriantoro & Supomo, 2011). The TC variable has 10 indicators which are taken from research by Salisu and Abu Bakar (2020) (see appendix 1).

b. Sustainable Competitive Advantage (SCA)

SCA is a strategy (cost leadership, differentiation & focus) that is relevant to achieving long-term market advantage (Quaye & Mensah, 2019). SCA is a competitive advantage that can be maintained in the long term, which allows a company to achieve higher profits compared to its competitors. SCA can be achieved through generic competitive strategies such as differentiation and cost leadership (Madhavan et al., 2022). This competitive advantage can provide significant added value to customers and is difficult for competitors to imitate, so that the company can maintain a strong market position (Setyawati et al., 2023). In a competitive market share environment, companies are increasingly focused on increasing their competitive advantage in the long term. However, from an economic perspective, competitive activity can cause profitability and market share to return to the average over time and ultimately erode the company's competitive advantage, so that further study and analysis are important regarding SCA, especially in small businesses (Lu & Shaharudin, 2024). SCA acts as a moderating variable with a dual role that can act as an independent variable and a moderator (Kline, 2016). The moderator variable changes the relationship between the dependent and independent variables by strengthening or weakening the effect of the intervening variable (Rahadi & Farid, 2021). The SCA variable has 6 indicators which are taken from research by Tufan and Mert (2023) (see appendix 1).

c. Sustainable Performance (SP)

SP refers to an organization's ability to improve business results while balancing long-term economic, environmental, and social responsibilities (Al-Abbadi & Abu Rumman, 2023). SP is measured from various aspects, such as financial and non-financial aspects (Madhavan et al., 2022). SP is an approach used by companies to assess an organization's sustainability strategy by focusing on sustainability aspects, namely social and economic, cultural, and environmental preservation in every business consideration (Saputra et al., 2023). SP can also be interpreted as a company's capacity to fulfill social and environmental responsibilities along with economic performance. This SP ensures long-term profitability and social and environmental impacts by integrating sustainability into corporate strategy and business operations (Gazi et al., 2024). SP acts as a dependent variable in this study. The dependent variable is a variable that is influenced by the independent variable (Indriantoro & Supomo, 2011). The SP variable has 6 indicators which was taken from research by Salisu and Abu Bakar (2020) (see appendix 1).

D) Data Analysis

This study uses the help of the SPSS 22 program to process descriptive analysis data of respondents and Smart PLS 3.0 to process research data in the form of inner models and outer models. The outer model is used to check the data quality by testing the validity and reliability of the research indicator or variables. Testing on the inner model is applied in a study to find the relationship between research variables, testing is carried out on the relationship between independent variables and dependent variables directly, as well as indirect variable relationships. This study also adds R square adjusted testing, which is used to measure the proportion of variance or what percentage of the dependent variable can be explained by the independent variable in the research model. The quality index is also used to assess the research model or goodness of fit (Hair et al., 2017).

IV. RESULT AND DISCUSSION

A) Inner Model Test

a. Validity and Reliability

The Inner model test is conducted to test data quality, data validity is determined based on the outer loading test value of the research variable indicator with a cut off value above 0.6 (>0.6), and the average variance extracted (AVE) value with a cut off value above 0.5 (>0.5). The reliability of the research variable data is determined based on the cronbach's alpha value with a cut off value above 0.6 (>0.6) and composite reliability with a cut off value above 0.7 (>0.7) (hair et al., 2017).

Table 2: Validity and Reliability Test

Variables	Indicator	Outer Loading	AVE	Cronbach's Alpha	Composite Reliability
TC	TC1	0.767	0.656	0.940	0.949
	TC2	0.700			
	TC3	0.778			
	TC4	0.755			
	TC5	0.739			
	TC6	0.792			
	TC7	0.826			
	TC8	0.885			
	TC9	0.907			
	TC10	0.911			
SCA	SCA1	0.884	0.658	0.892	0.918
	SCA2	0.839			
	SCA3	0.849			
	SCA4	0.773			
	SCA5	0.788			
	SCA6	0.715			
SP	SP1	0.795	0.658	0.894	0.919
	SP2	0.791			
	SP3	0.834			
	SP4	0.812			
	SP5	0.798			
	SP6	0.832			

The results of the outer loading test show that all research variable indicators have an outer loading value above 0.7 (> 0.7) and AVE above 0.5 (> 0.5), which means that all indicators are valid. The results of the cronbach's alpha test show that all research variables in the construct model have a cronbach's alpha value above 0.6 (> 0.6) and composite reliability above 0.7 (> 0.7), which means that all research variables are reliable. This shows that the research data has met the requirements for testing data validity and reliability, so that this data can be used for further data processing (Hair et al., 2017).

B) Outer Model Test

a. Hypothesis Test

The connection and impact between variables in the research model can be evaluated using the results of the path coefficient test. A significant relationship is considered to have an effect and significant if it meets the requirements, which is having a p value under 0.05 (<0.05).

Table 3: Hypothesis Test

Path	Original Sample	Sampel Mean	P values	Hypothesis
TC -> SP	0.163	0.164	0.049	H1 Accepted
SCA -> SP	0.671	0.610	0.000	H2 Accepted
TC -> SCA	0.320	0.334	0.000	H3 Accepted
TC -> SCA -> SP	0.215	0.206	0.001	H4 Accepted
Moderating Effect SCA -> SP	0.014	0.011	0.936	H5 Rejected

Based on the test results, TC is significant to SP, with a p-value of 0.049 (<0.05) and has a positive effect on the original sample value of 0.163, so H1 is accepted. SCA is significant to SP, with a p value of 0.049 (<0.05) and has a positive effect on the original sample value of 0.671, so H2 is accepted. TC is significant to SCA, with a p value of 0.049 (<0.05) and has a positive effect on the original sample value of 0.320, so H3 is accepted. Based on the sample mean value, it can be identified how big the significance value is on the influence between variables. The influence of TC on SP has a significant value of 0.164 (>0.05), the influence of SCA on SP has a significant value of 0.610 (>0.05), the influence of TC on SCA has a significant value of 0.334 (>0.05).

The relationship between TC and SP through SCA mediation has a p value of 0.001 (<0.05) and has a positive influence with an original sample value of 0.215, so H4 is accepted. This relationship has a significant value of 0.206 (> 0.05). The effect of TC on SP with SCA moderation has a p value of 0.936 (> 0.05), and an original sample value of 0.014, the role of SCA moderation strengthens the influence of TC on SP but not significantly. so H5 is rejected, and SCA does not play a role in moderating the relationship between TC and SP.'

C) R Square Adjusted

The R square adjusted is used to measure the extent to which the regression model can explain the variation in the observed data. The higher the adjusted r square adjusted value, the greater the model's ability to explain the data's variation and the stronger the relationship between the variables involved. (Hair et al., 2017).

Table 4: R Square Adjusted

Variabel	R Square Adjusted
SP	0.555

Based on the r square adjusted value, it shows that the SP variable has an adjusted r square value of 0.555. This means that the TC and SCA variables which are independent can explain the dependent variable, namely SP, by 55.5%, and the remaining 44.5% is explained by other variables or factors that are not included in the research construct model.

D) Quality Index

The quality index is used to assess goodness of fit of the research model. Quality index can be calculated using the formula proposed by Jörg Henseler (2013). First, calculate the average communalities (AVE) and the average r square, then continue by multiplying the results and rooting them (GoF = √ (0.658 X 0.338)). The value of the calculation of the quality index shows a GoF value of 0.472, so this value can be classified into a large GoF, namely > 0.36.

E) Discussion

Hypothesis 1

TC has a positive and significant effect on SP, so H1 of the study is accepted. These results reflect that culinary startups in Batam City have TC that can improve SP. This TC can be in the form of using a sales system using an e-commerce platform, using financial technology such as fintech for payments, and using social media for promotions.Through effective mastery of technology, companies can design and create more innovative and efficient products and services that better meet customer needs. This strengthens the company's ability to survive and supports the achievement of overall SP (Salisu & Abu Bakar, 2020).

Adopting new technologies such as procedures, machines and equipment also allows companies to save energy and product development costs. A business that has better technology and utilizes its functions such as the use of social media, artificial intelligence (AI) and online sales sites is better able to improve their economic performance (Valdez-Juárez & Castillo-Vergara, 2021). The importance of investing in developing TC allows companies to implement new technologies and increase efficiency (Medeiros Vila Nova & Bitencourt, 2020). The findings of this study are supported by previous studies Fegada and Veres (2024); Djiu et al. (2024); Md Hassan and Ibrahim (2022); Salisu and Abu Bakar (2020); Valdez-Juárez and Castillo-Vergara (2021).

Hypothesis 2

SCA has a positive and significant effect on SP, so H2 of the study is accepted. These results reflect that culinary

startups in Batam City have a SCA that can improve SP. This SCA can be in the form of a product that has its own uniqueness or distinctiveness, considering the diversity of culinary types in Batam City which is the advantage of culinary startups in Batam City. In terms of product and service quality, it can also be a competitive advantage for the business, then the advantage in terms of price can also be a supporting factor, especially for small businesses like this startup. These things can help culinary startups in Batam City drive their SP. SCA has a positive and significant effect on SP, especially in the financial aspect (Madhavan et al., 2022).

Companies can achieve SCA and SP if they have unique resources, skills, and capabilities. Companies that are unable to respond quickly to environmental changes can lose their competitive position in market share (Tufan & Mert, 2023). Competitive advantage also comes from various activities carried out by the company, such as designing, producing and marketing, and distributing their products. Developing competitive advantage requires speed and flexibility, not only focusing on profitability (Yusuf et al., 2023). The findings of this study are supported by previous studies Pumiviset and Suttipun (2024); Tufan and Mert (2023); Çağlıyan et al. (2022); Madhavan et al. (2022); Hussain et al. (2020); Kim et al. (2020).

Hypothesis 3

TC has a positive and significant effect on SCA, so H3 of the study is accepted. These results reflect that culinary startups in Batam City have TC that can increase SCA. The TC possessed by a business can help in the adoption of technology in their business operations. The adoption of technology makes it easier for culinary startups to increase the efficiency of the operating system and support the process of product or service innovation. The use of technology such as social media or information technology helps culinary startups to innovate their products or services to differentiate them from other competitors. The use of this technology also makes it easier for culinary startups to find out market needs and trends, which in turn can increase their SCA.

Technology helps SCA by providing the tools and strategies needed to improve effective management, innovation, and decision-making processes (Amesho et al., 2022). Companies with high technological capabilities can gain a superior position in market share, but only a few companies succeed in achieving and maintaining SCA. This is because this development is greatly influenced by changes in the external and internal environment (Feng et al., 2020). TC enables companies to create differentiation in responding to changes in market share through efficient innovation processes. TC also facilitates companies in acquiring and combining new knowledge to produce innovative products. Companies that develop TC advantages tend to achieve greater efficiency and superior product differentiation and are more innovative in responding to rapid market demand and changes (Nwodo et al., 2024). The findings of this study are supported by previous studies Djiu et al. (2024); Nwodo et al. (2024); Çelik and Uzunçarşılı (2023); Tong et al. (2022); Feng et al. (2020).

Hypothesis 4

TC has a positive and significant effect on SP through the mediation of SCA, so H4 of the study is accepted. These results reflect that culinary startups in Batam City have the TC that improve SP through the mediation of SCA. The use of technology can make it easier for culinary startups to improve their excellence and performance, such as using the Point-of-Sale system, fintech payments, and online sales that can facilitate consumers who can increase their competitive advantage. The use of social media and AI as a means of collecting information related to consumer needs is also one way for startups to create products that are by market needs and existing trends, this can be the uniqueness of their products or services, then ultimately can improve overall business performance. Technology-oriented and innovative strategies have been shown to have a significant positive impact on business performance. Especially in increasing sales, profitability, and product performance (Çelik & Uzunçarşılı, 2023).

Technological developments can also trigger market competition, easy access to technology has led to the emergence of many new companies. Makes it important for companies to be able to utilize this technology to improve competitive advantage and business performance, such as using social media (Djiu et al., 2024). The introduction of new technologies can also help companies respond effectively to customer needs and environmental changes. Companies can improve the quality of their products with new technologies. The results of new technology implementation activities vary depending on the scale and method of implementation. Successful technology implementation can improve performance and strengthen the competitiveness of companies (Kim et al., 2020). The findings of this study are the novelty of this study.

Hypothesis 5

SCA does not significantly moderate the relationship between TC and SP, meaning that H5 of the study is rejected. However, the results of this study found that SCA can strengthen the influence of TC on SP, although not significantly. The age factor of respondents who are culinary startup owners can be one of the causes of this result. The majority of respondents who are still relatively young, namely 18-29 years old, are indeed more open to technology, but the lack of experience in implementing and utilizing technology to improve SP in the long term makes the moderating effect of SCA insignificant. The

level of education factor which is only senior high school can cause limitations in strategic skills for sustainable business management and can also reduce the impact of SCA on this influence. This shows that the demographic factors of business owners can influence technology adoption, lack of experience, insight, and skills can reduce its influence on SP. The findings of this study are new or novelty from this study.

V. CONCLUSION

This study aims to analyze the SP of culinary startups in Batam City. This analysis is carried out by testing factors that can affect SP, namely TC and SCA. This study also shows new findings or novelty, which is the mediation impact of SCA on the influence of TC on SP, then the moderation impact of SCA on the relationship. The results of this study indicate a positive and significant influence of TC and SCA on SP, as well as a positive and significant influence of TC on SCA. This study also found a mediation impact of SCA on the positive and significant influence of TC on SP, which is a novel finding of this study. However, the results of this study do not show any moderation impact of SCA on the relationship.

The results of this research analysis are expected to have implications both theoretically that can contribute academically, as well as managerial implications that can contribute to startup business management strategies. The theoretical implications of this research are to contribute to the development of strategy science, especially in the development of small businesses, by enriching the understanding of the application of TC theory, SCA, business model innovation, and SP. The findings of this study support previous theories and research and offer novelty that enriches knowledge about SP. The managerial implications of this research are that using technology, such as production efficiency, innovation, fintech, social media for promotion, and partnerships with e-commerce platforms, competitive advantages can be created and market share expanded, thereby improving long-term business performance.

VI. REFERENCES

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