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Environmental Scanning on Competitive Advantage in Small Medium Enterprises: The Role of Innovation

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Abstract

Innovation is the main key in achieving competitive advantage in business. Due to the dynamic business environment, small and medium enterprises (SMEs) must prioritize innovation to sustain their competitive advantage. This report offers a comprehensive perspective on how SMEs may effectively cope with any changes and sustain their competitive advantage through innovation. Therefore, explaining the main predictors of innovation in achieving competitive advantage in a dynamic environment is important to do. Through organizational information processing theory (OIPT), this study proposes environmental scanning as the main predictors in explaining innovative performance which in turn has an impact on competitive advantage. Data were collected from 142 SMEs in Indonesia from various industries. Testing the proposed hypothesis of the research was assessed with SEM by assisting Amos software. The results indicated that environmental scanning positively influence competitive advantage. Further the findings were also supported that innovative performance significantly mediates this relationship. Implications of the research were also discussed in this paper.

Keywords: environmental scanning; innovative performance; competitive advantage; SMEs

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Introduction

SMEs are increasingly facing conditions full of uncertainty including non-organizational situations such as natural disasters, technological issues in highly unpredictable times and under uncertainty (Duchek, 2020). The way businesses operate has rapidly changed due to pressures from the global economy (Hamsal & Ichsan, 2021), for example the transformation towards digitalization. Conventional methods and strategies for managing businesses are becoming perceived as insufficient in dealing with an uncertain and dynamically changing environment (Haarhaus & Liening, 2020). Consequently, it is imperative for SMEs to seek out novel approaches or strategies in order to sustain their competitive advantage (CA). Research indicates that firms must adopt a proactive approach by leveraging technological innovation to effectively modify their product and process portfolios in order to sustain their competitive edge. It seems to be considered the main goal for businesses (Alraja et al., 2022). Furthermore, firms may strengthen their competitiveness by creating internal systems and responding to external business environments (Diab, 2014).

Innovation is regarded as a tool that can motivate firms to enter both new and established markets. Innovation facilitates market expansion and presents prospects in both local and global markets through the introduction of novel products and concepts (Williams, 2007). Corporations perceive innovation as a crucial competency due to its potential to drive growth by introducing novel products. Consequently, this results in higher sales, improved profitability, and better competitiveness (Battor & Battor, 2010; Sivadas & Dwyer, 2000). Innovation is essential for improving an

organization's competitive advantage (Ho, 2011; Porter & Van Der Linde, 1995).

The ability of a company to effectively meet the requirements of its consumers is a critical factor in determining the nature of the link between innovation and the establishment of competitiveness (Dustin et al., 2014). In organizations, innovation can manifest as the ability to adapt to a constantly changing environment, where the creation of long-lasting competitive advantage guarantees the organization's survival and success in the market (Pulgarín Medina & Guerrero, 2017). Innovation is not only crucial for competitive advantage, but also plays a pivotal role in fostering sustainable growth. An organization's capacity and preparedness to innovate becomes crucial when it comes to adjusting to environmental changes (Wang et al., 2021).

In today's rapidly changing digital landscape, organizations must prioritize innovation in order to meet the evolving expectations of customers and stakeholders. To stay competitive, organizations need to adopt a digital mindset that allows them to identify and capitalize on opportunities, as well as navigate the challenges of operating in a dynamic environment. This requires organizations to adapt their existing structures and processes to keep up with the latest technological advancements (Erhan et al., 2022). Additionally, in order to effectively adapt to changes in customer demand and eliminate supply chain risks, businesses need to modify their internal procedures, methodologies, and practices so that they are in line with the present circumstances (Yu et al., 2019).

Interestingly, organisations are reliant on and impacted by their external environment. Therefore, organisations can do environmental scanning (ES) to comprehend external factors that drive change. Consequently, organizations might formulate efficient strategies that maintain or enhance their standing in forthcoming situations (Gable & Topol, 1987). A better awareness of the business environment should be gained by organizations through the use of scanning activities. This will allow them to develop strategies that will provide them with a sustained advantage over their competitors. Organisations function within the information technology era, wherein their success rely upon their understanding and utilisation of the resources available for them. Competitiveness in this scenario will be contingent on ability to proficiently gather, analyse, and utilise information for decision-making purposes (Cancellier et al., 2014). A leader who possesses the capacity to anticipate and prepare for potential challenges in the future by analysing the external environment, as well as the ability to forecast and plan, will be empowered by their skill in effectively managing crucial organisational resources in order to attain a lasting competitive edge (Hirschi & Jones, 2009). Hence, it can be inferred that doing a thorough analysis of the business environment can enhance the competitiveness of organisations.

An earlier body of research, such as the investigation that was carried out by Gable and Topol (1987), highlighted the importance of doing environmental scanning in order to get a competitive advantage. Both T. W. Tang (2014) and Grimpe & Sofka (2009) highlight the significance of understanding external trends in order to increase organizational innovation. Dustin et al. (2014), on the other hand, demonstrate the impact that innovation has in reinforcing competitive advantage. Nevertheless, there is a dearth of research that explores the correlation between ES and CA through an examination of the intermediary role played by organisational innovation. Hence, the objective of this study is to address a deficiency in existing research by examining how the characteristics of organisational innovation operate as a mediator in the relationship between ES and CA. The objective of this research is to provide a thorough comprehension of the competitive advantage of small and medium-sized enterprises (SMEs).

This research use OIPT to clarify the relationship between ES and CA across innovation. OIPT asserts that uncertainty involves a higher level of information processing capability, as

shown by the works of Daft et al., (1988) and Galbraith (1973). Therefore, the operations management literature has explored methods to decrease the need for information processing by employing techniques such as organizational design, bridging, and lateral information systems (Flynn & Flynn, 1999; Galbraith, 1973). Nevertheless, the extent to which the ability to analyze information gathered from scanning surroundings for the purpose of gaining a competitive advantage has been thoroughly investigated remains limited (Yu et al., 2019).

Researchers contend that innovation functions as a mechanism for analyzing and comprehending information, so diminishing ambiguity and enabling endeavors to obtain competitive advantage in light of evolving environmental patterns. In order to accomplish this objective, researchers suggest a model of competitive advantage that combines ES and innovation. Researchers believe that the proper analysis and application of data acquired through environmental scanning, which leads to innovation, is the major predictor of an organization's competitive advantage.

Literature Review

Environmental Scanning

ES is an essential technique employed by enterprises to recognize and handle uncertainty in their external surroundings. It involves collecting relevant information about external events and trends to guide future actions. The concept of ES by Hambrick (1982) who defined it as the process of gathering information about events occurring outside the organization. Choo (2001) describes it as the process of obtaining and using knowledge about external events, trends, and relationships to assist in the organization's future planning and activities.

Organizations are confronted with unprecedented and swift transformations. Organizations that fail to actively seek information are at risk of falling behind in the middle of competition (Albright, 2004). ES is seen as a crucial aspect for managing environmental uncertainty (Bhardwaj & Kumar, 2014). Business or profit companies frequently employ ES to gain a comprehensive understanding of external factors that may impact their operations. This enables them to develop effective strategies to maintain and improve their future position. Moreover, the act of doing ES helps companies to anticipate unforeseen circumstances, identify possible risks and opportunities, gain an advantage in the market, and improve both short-term and long-term performance (Bhardwaj & Kumar, 2014).

Organizational Innovation

A company's ability to effectively apply novel ideas is known as organizational innovation (Amabile, 1988). These innovative concepts can encompass ideas for novel products, methodologies, or services inside a firm's industry, as well as suggestions for fresh protocols or guidelines within the organization itself. The term "innovation" is used in a comprehensive sense to include all aspects of creating ideas and utilizing them for the improvement of the company (Amabile, 1988). The organization's capacity to consistently generate novel ideas will provide a competitive edge to the organization (Vargo & Lusch, 2017). From the standpoint of a SMEs, innovation often pertains to the development of a novel product or process that surpasses existing ones in terms of competitiveness and profitability (O'Regan & Ghobadian, 2006).

Innovation holds great significance for SMEs. Companies in today's world consider innovation and continual expansion to be crucial elements that contribute to the enhancement of their CA (Ho, 2011). Organizations that possess the ability to adapt and create in response to changes in their surroundings are more likely to produce an increased number of innovative products, and capitalize on market opportunities (Jiménez-Jiménez & Sanz-Valle, 2011). This leads to changes in the complicated organizational environment (Dixon et al., 2014). Multiple instances demonstrate that SMEs possess the

capacity to generate a broader scope for innovation, as they exhibit greater adaptability in conducting ES. Rapidly adjusting to evolving environmental requirements, organizations can substantially transform the industries in which they operate through their innovative. This innovation might begin by diversifying the range of products and services currently offered by SMEs (El Hadi, 2016).

Competitive Advantage

Competitive advantage (CA) refers to a company's capacity to effectively build and sustain a favorable position in comparison to its competitors (Wu et al., 2017). Barney (2002) asserts that a firm is able to acquire competitive advantage (CA) when decisions made within the industry or market provide economic value that competing organizations are unable to afford to supply. CA occurs when a company provides clients with products or services that are superior to those offered by its competitors. CA is a distinct benefit that a business possesses over its rivals, achieved by offering greater value to clients. This can be accomplished through lower pricing or by delivering additional goods and services that justify higher costs (Ambe, 2010).

CA consists of three primary forms: low cost, differentiation, and focus (Porter & Millar, 1985). An firm possesses a competitive edge when it is capable of providing its goods or services at lower prices compared to its rivals. Provided that the product quality meets expectations, it will lead to increased profit margins and returns. In any market characterized by intense global rivalry and poor economic and industrial growth. Numerous firms are seeking novel approaches to attain and sustain a competitive edge (Sunhilde, 2011). Managers recognize that the key to gaining a CA in the future is the organization's ability to learn at a greater pace than its competitors (De Geus, 1988; Hansen, 2002).

Environmental Scanning, Organizational Innovation, and Competitive Advantage

ES is commonly recognized as the initial stage in connecting strategy with the environment (Haarhaus & Liening, 2020). It enables an organization to gather information about potential opportunities to exploit and potential threats that may impact its performance or existence. This information is then used to develop competitive strategies that are suitable for the prevailing environmental conditions. An organization's long-term competitiveness is heavily reliant on its capacity to detect subtle indicators and capitalize on favorable circumstances (Zhang et al., 2011), Organizations use ES to comprehend external catalysts of change. Consequently, they are able to react efficiently and uphold or enhance their position in the future (Gable & Topol, 1987). Organizations must engage in ES to gain a comprehensive understanding of their competitive landscape. This knowledge will allow them to build approaches that will provide them a long-term CA. In the current era of information-driven economy, the ability of a company to effectively gather, analyze, and utilize information plays a crucial role in determining its competitiveness (Cancellier et al., 2014).

In comparison to the past, the contexts in which organizations function now are significantly more complex (Van De Ven et al., 1983). Consequently, organizations seeking to utilize information as a means of gaining a CA must carry out their scanning efforts in a systematic and deliberate manner (Subramanian et al., 1993). ES is a proactive approach to avoid unexpected environmental changes. It enables managers to detect and analyze shifts in the environment and to understand the procedures employed by competitors. In order to adapt to the environment, organizations must possess a comprehensive understanding of their surroundings, encompassing factors such as consumer requirements, rival accomplishments, supplier circumstances, and government restrictions. As a result, the knowledge gained from the surrounding environment is

recognized as a crucial resource for the achievement of organizational success (Cancellier et al., 2014).

Amidst the current volatile business landscape, organizations encounter numerous obstacles and uncertainties. Consequently, if a business fails to prioritize and execute ES, it runs the risk of complete extinction, heightened vulnerability to mistakes, and a lack of comprehension regarding market demands. Eventually, this will have an adverse impact on its competitive position within the market. Conducting an environmental scan is an essential procedure in order to identify and maximize opportunities while mitigating potential risks. It assists in predicting forthcoming environmental factors that may have an influence on the SMEs competitive advantage (Nady et al., 2014). Comprehensive examination of the business environment could potentially enhance the CA of an organization. Therefore, the following hypothesis is proposed:

H1. Environmental scanning has a positive impact on the SMEs competitive advantage.

Firms with strong proficiency in identifying external trends are more capable at adapting internal resource allocation to foster the development of new goods, enhance existing products, and effectively react to changing situations (T. W. Tang, 2014). Developing the level of ES will concurrently promote comprehension of the external environment. ES could help a business's innovative efforts by raising its ability to absorb and understand current information (Koberg et al., 1996), facilitating the identification and acquisition of resources for innovations (Tang, 2014), and aiding in the comprehension of customer needs and differentiation of its innovation from competitors. Consequently, the company has a higher probability of obtaining beneficial resources from the external environment. Moreover, doing ES enables firms to enhance their focus and responsiveness towards occurring changes, thereby facilitating the identification and exploitation of innovative ideas (Grimpe & Sofka, 2009).

Organizations utilize ES as a strategic forecasting technique (Haarhaus & Liening, 2020). Ruff (2006) suggests that the forecasting approach enables rapid recognition of potential risks and opportunities, and it also demonstrates the evaluation of innovative concepts. Moreover, adopting a strategic perspective that promotes continuous learning and the ability to forecast future trends is crucial for driving the swift advancement of innovative products and services (Andriopoulos & Gotsi, 2006). Organizational capabilities offer a holistic perspective on the future development of the environment, leading to the generation of new ideas (von der Gracht et al., 2010).

ES focuses on quantifying, forecasting, and assessing alterations in many facets of the environment. In today's environment, the majority of firms design diverse strategies to ensure their survival in the competitive environment. This objective can only be accomplished through the practice of ES. In addition, ES facilitates the transfer of information to top-level managers, enhancing their awareness of the surrounding environment. This enables them to make more informed and prompt decisions, implement suitable strategies, prevent unintended events, and guide their organizations in capitalizing on emerging opportunities through modifications in existing processes, improved production and product delivery processes, or the initiation of new products and services through firm innovation (Ireland et al., 2009). We therefore propose the following suggestion as a possible explanation:

H2: Environmental scanning has a positive impact on SMEs innovative performance.

The capacity of an organization to innovate is acknowledged as one of the key aspects that determine its ability to survive and thrive (Doyle & Wong, 1998). The capacity of an organization to

create novel products and services and use creative business models is a crucial strategy for attaining optimal organizational outcomes (Puspita et al., 2020; Putra et al., 2023). Organizations can gain a CA and increase their market share by offering highly usefull goods and services.

Porter (1990) establishes a strong correlation between organizational innovation and the process of gaining a CA. Organizations can achieve and sustain an advantage over their competitors by developing novel approaches to carry out value chain tasks, with the aim of providing exceptional customer value. This process is known as innovation. Innovation is seen as a crucial organizational capacity due to its role in driving growth and influencing the organization's sales, earnings, and competitiveness. According to the findings of Lee & Hsieh (2010), an organization's CA is directly impacted by its innovation capability. Similarly, Anning-Dorson (2018) discovered that innovation exerts a substantial impact on CA. Organization innovation, sustainability, and change are the primary components of global competitiveness (Higón, 2012). Additionally, his research revealed that both product and process innovation are crucial for attaining a CA in a rapidly changing market.

To remain viable amidst intense rivalry in the contemporary business landscape, organizations need to participate in innovation. This is due to the dynamic nature of technology, markets, consumer expectations, and globalization that accompany the current business environment. Dada & Fogg (2016) highlight the importance of SMEs generating intentions for innovation in order to capitalize on opportunities and achieve a CA, leading to an increase in market share. CA is determined by internal and external construction systems based on the organization's resources and innovation capabilities, which are influenced by the external environment (Diab, 2014). Innovation serves as a tool that enhances the capabilities of a company when it enters new or existing markets, ensuring competitiveness of business (Williams, 2007). Innovation is a crucial capacity for organizations as it serves as a catalyst for growth and can lead to enhanced sales, profits, when new products are introduced successfully (Battor & Battor, 2010; Sivadas & Dwyer, 2000). We therefore propose the following suggestion as a possible explanation:

H3. SMEs innovative performance has a positive impact on the SMEs competitive advantage.

Innovative thinking is necessary for organizations in order for them to effectively react to changes in their external environment (Martin-Rios, 2016). Innovation plays crucial roles in enabling firms to enhance their CA (Ho, 2011). Organizations with a strong capacity for innovation are more proficient at quickly responding to environmental challenges, creating a greater number of new products, and efficiently identifying market opportunities compared to non-innovative competitors (Jiménez-Jiménez & Sanz-Valle, 2011). An organization's capacity to adapt to changes in its difficult environment can be optimized by incorporating new products and processes (Dixon et al., 2014).

Innovation refers to the capacity to absorb and employ external information in order to convert it into novel insight (Cohen & Levinthal, 1990). Therefore, firms that possess the capacity to conduct ES can assimilate and utilize the acquired knowledge to modify their internal procedures and operational strategies, thereby attaining a CA over their rivals. The argument behind this theory is that conducting ES enables firms to gain a deeper comprehension of external issues and, consequently, modify and enhance their internal processes in order strengthen their competitive position. Organizations that dedicate resources to actively observing and studying their external environment are more capable of cultivating innovative behavior, which in turn ultimately strengthens their CA (Ramaswami et al., 2009). (Helfat & Peteraf, 2002) argue that organizations that effectively adapt to their external environment can strategically adjust their resources and processes to develop skills that offer long-term CA.

In accordance with the OIPT, organizations must augment their information processing capabilities in order to accommodate growing uncertainty (Daft & Lengel, 1986). On the basis of OIPT, it is possible to conclude that ES is a tool that organizations can employ to acquire environmental information in order to increase their competitiveness. Nevertheless, in order to leverage the insights learned from ES for the purpose of establishing an advantageous position, it is critical to conduct a thorough analysis and processing of the data, transforming it into novel capabilities that improve that advantage. As a result, this study examines innovation as a strong intermediary through which organizations can translate the competitive signals derived from environmental monitoring. Therefore, it can be asserted that the establishment of CA is a multi-stage undertaking beginning with scanning, followed by analysis and restructuring of the internal processes and management approaches of the organization via innovation, differentiation development, and organizational survival by means of augmenting CA. Therefore, the following hypothesis can be proposed:

H4. Innovative performance mediates the relationship between environmental scanning and SME competitive advantage.

Methods

Research design

This research is explanatory and quantitative research. An explanatory research approach is used to test variables that are determinants of CA in SMEs in Indonesia. Furthermore, the quantitative approach is intended to test a model that explains the relationship between variables derived from the literature, namely the digital leadership variable and ES as antecedents of the innovation variable and the CA variable as a consequence. This research data is cross sectional in nature using a survey method to collect primary data. To validate the suggested theoretical model, an analysis technique that uses Structural Equation Modeling using the AMOS application is employed.

Population and Sample

The population of this research is SMEs operating in West Sumatera-Indonesia. The business sector of SMEs is engaged in the service, home industry and trade. This research sample was taken from managers, decision makers, or SME owners. Determining the number of samples for this study used purposive sampling with an number of samples taken of 142 respondents.

In this study, the majority of respondents were male, namely 58.6%. Respondents with an age range of 20 to 40 years or the millennial generation were the most numerous, namely 76,2%. Most of them are businesses operating in the processing industry, namely 41.4%, followed by other service activities. Most of the respondents' education was high school, namely 58.6% of the total respondents, followed by bachelor's level education at 31%. Meanwhile, S2 is 6.9%. This shows that respondents generally have high education.

Measurement

The term of instruments development in this research context pertains to the examination and utilization of existing studies and literature. The researcher utilized a questionnaire as a fundamental instrument to gather the requisite data for analyzing the associations between research variables. The replies were assessed using a five-point likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The measurement of ES utilizes 8 item scales derived from Haarhaus & Liening (2020) research. The measurement of organizational innovation is conducted using a set of 7 scale items devised by J. Tang et al. (2013). We evaluated CA using a 11-item scale derived from Li et al. (2006).

Data Analysis

The data analysis method utilized in this study is Structural Equation Modeling (SEM), and

the AMOS software is employed for data processing. According to Hair et al. (2014), SEM is a variant-based structural equation analysis that can simultaneously evaluate measurement models as well as evaluate structural models. Data analysis was carried out in 2 stages, the first stage was to carry out Confirmatory Factor analysis (CFA) to determine measurement fit. Meanwhile, in the second stage, evaluate structural model by considering model fit.

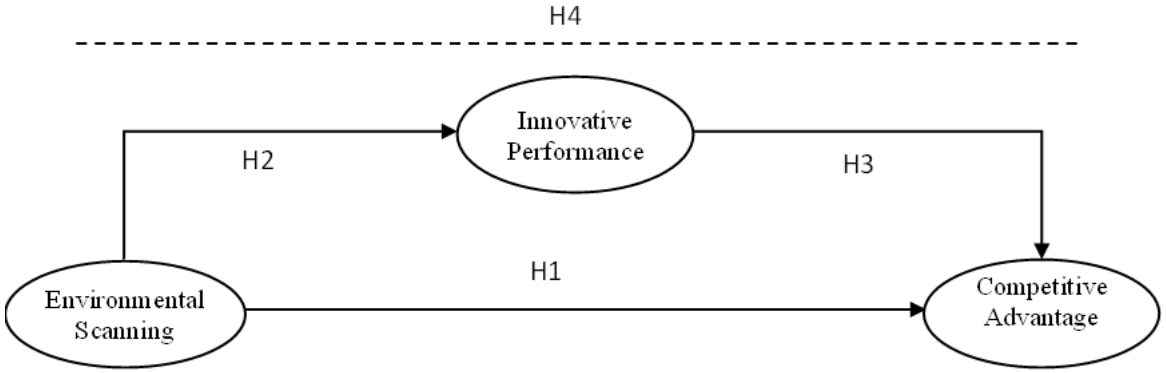

Figure 1. Theoretical framework.

Results and Discussion

Common Method Variance

The common method bias test was conducted due to the utilization of a one-wave self-report design, where all variables were gathered simultaneously. To ascertain if a single factor explained a significant portion of the variance across measurements, Harman's single-factor technique was employed (Podsakoff et al., 2003). Factor analysis was conducted using a principal components method that generates variance. The first factor extracted just 33.45% of the variance, which is less than 50%. The findings indicated that no prominent factor arose from the factor analysis.

Validity And Reliability

All items in this research questionnaire have been extracted completely through data processing in AMOS software and produced a large factor loading of 0.7. So that all indicators are valid and meet the requirements for explaining constructs well and interpreting variable intercorrelations. Variable measurements can be said to be valid if they reach >0.7 (Hair et. Al., 2019). So, it can be concluded that all indicators in this research are valid. Then the Average Variance Extracted (AVE) value shows that each variable has a good item measurement variance, namely > 0.50 as a condition for the AVE value.

Based on the data in Table 1, it can be concluded that all the variables in this study have a good level of reliability. All variables have a reliability value > 0.7. In this case, it can be interpreted that each item that measures each variable in this study is reliable in measurement.

Measurement Fit

Within the context of the comprehensive measurement model, a confirmatory factor analysis (CFA) was carried out. All of the indicators showed results that were not satisfactory during the preliminary inspection. Because of this, indicators that have a low factor loading are not included in the analysis. After that, the test was carried out once again, and the results indicate that the measurement three-factor model has fit indices that are satisfactory (x/df = 5.263; p < 0.000, IFI = 0.83; TLI = 0.79, CFI = 0.827, RMSEA = 0.138, RMR = 0.028).

Table 1 Construct Reliability Testing

Variable	Cronbach's Alpha	Composite Reliability	AVE
Competitive Advantage	0.863	0.902	0.648

Environmental Scanning	0.805	0.873	0.632
Inovative Performance	0.836	0.901	0.753

Source: Processed data (2024)

Model Fit

The structural model demonstrated good fit indices, with a chi-square to degrees of freedom ratio of 5.623, a p-value less than 0.000, an incremental fit index (IFI) of 0.828, a Tucker-Lewis index (TLI) of 0.79, a comparative fit index (CFI) of 0.827, a root mean square error of approximation (RMSEA) of 0.138, and a root mean square residual (RMR) of 0.028. According to Table 2, there is no statistically significant difference between the evaluation of the measurement model and the evaluation of the structural model with regard to the assessment of the measurement model. In light of the fact that the structural model provides data that is a reasonable fit, it was utilized as the basis for evaluating the study hypotheses.

Table 2. Measurement Model and Structural Model Fit

Indicator	Measurement Fit	Structural Model Fit
CMIN/DF	1.785	1.785
Chi-Square	101.771	101.771
IFI	0.965	0.965
GFI	0.908	0.908
NFI	0.923	0.923
CFI	0.964	0.964
TLI	0.951	0.951

Source: Processed data (2024)

Table 3. Structural Model Evaluation Results

Hypotheses	Path Coefficient	P Values
Direct Relationship		
H1: ES → CA	0.397	***
H2: ES → IP	0.278	***
H3: IP → CA	0.727	***
Indirect Relationship (H4: ES → IP → CA)		
ES → IP	0.259	***
IP → CA	0.552	***
ES → CA	0.244	***

Source: Processed data (2024)

Structural Model Evaluation

Structural equation modeling was utilized in order to investigate both the direct and indirect effects that interactions between research variables have. Due to the fact that the structural model provided a reasonable match to the data, it was utilized as the basis for evaluating the hypotheses that were being investigated in the study. Table 3 displays the findings that were obtained from the structural model that was investigated.

Hypothesis 1 proposes that ES has a significant and positive effect on CA. Research findings show a beta coefficient of 0.397 and p value of 0.000. Hypothesis 1 is supported. This finding is in line with research developed by YahiaMarzouk & Jin (2022) where ES has a significant influence on CA.

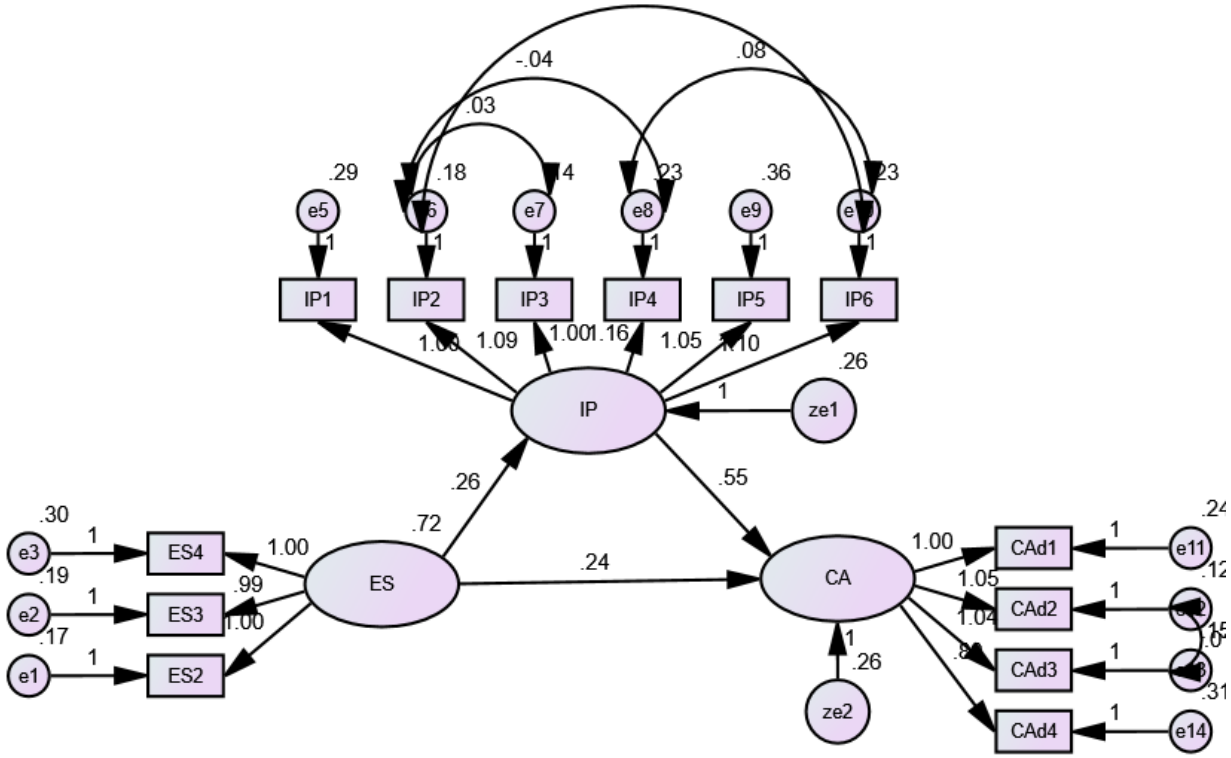

Figure 1 Mediating test (ES --> IP --> CA)

Hypothesis 2 proposes that ES has a positive and significant effect on innovation performance. The findings show that the beta coefficient is 0.278 and the p value is 0.000. Hypothesis 2 is supported. These findings provide support for research conducted by (YahiaMarzouk & Jin, 2022) which proves that ES has a positive and significant relationship with organizational innovation. Ologbenla (2022) also revealed that ES has a positive and significant relationship with organizational innovation. IP also has a positive and significant relationship with SMEs competitive advantage (beta coefficient of 0.727 & p value of 0.000). Therefore, Hypothesis 3 is supported.

In order to examine the mediating effect, researchers implemented a methodology inspired by Baron & Kenny (1986). As previously stated, ES has a beneficial and substantial impact on the competitive advantage of SMEs. Subsequently, the process of mediation testing might be resumed. If the ES influence competitive advantage of SMEs to be insignificant, full mediation happens. Partial mediation refers to a situation where the association between two variables remains significant but becomes weaker after considering the mediating variable. When considering mediating factors, the variables of ES and SMEs competitive advantage continue to be substantial and more pronounced. This process has been carried out in hypotheses 1, 2, and 3. So the mediation test can be continued.

The mediation test demonstrates that ES still significantly influences competitive advantage through IP, but the beta coefficient becomes weaker compared to the direct relationship, namely b = 0.244 and p-value = 0.000. IP plays a partial mediation in connecting ES with the competitive advantage of SMEs. ES affects CA is a distal process. ES has a limited mediating effect on CA of SMEs, because ES also has a direct contribution to CA. Thus, IP partially mediates the relationship between ES and CA of SMEs. Therefore, H4 is confirmed.

Conclusions

ES has a substantial role in building the CA of SMEs. Therefore, it can be interpreted that the better the ability of SMEs to scan and explore information from their business environment, the more likely it is to encourage SMEs to become more competitive and able to maintain the advantages they have in the competition. This can be realized by getting information sources from the external environment, this information can be used as a reference for SMEs to detect markets and analyze competition and can encourage them to create added value for the products and services they offer to consumers, which in turn will make SMEs become more competitive and defensive against the advantages they already have.

ES also has a crucial role in building innovation values in SMEs. The better a company's ability to scan their external environment, this can encourage SMEs to become more innovative. This can be applied by SMEs by exploring all important information from the external environment and understanding the competitive situation. They can utilize this information as a source to create innovative values in the products and services offered as well as innovations in other aspects of running a business.

The better the quality of innovation created by a company; this can encourage them to become more competitive in the competition. Based on the findings of this research, if ES does not encourage the creation of IP, then CA in SMEs will not occur. This is an indirect process that must be passed, how ES impacts SMEs competitive advantage. If ES is low, it can be predicted that SMEs competitive advantage will also be low. The mediation that occurs provides insight that SMEs must be active in scanning the environment to obtain IP which will have an impact on their CA. This can be realized by SMEs by encouraging organizational resources to create added value through innovation in all aspects of running a business, so that this can be a driver for SMEs to create something new, different, and even superior to competitors, and ultimately companies can have good capabilities to create added value, be superior and competitive than competitors.

Research Contribution

The results obtained from this research provide substantiation for the organizational information processing theory, in elucidating the connection between ES within a SMEs setting. To gain a deeper understanding of these theories, it is important to examine how organizations interpret business environment and converts them into innovative processes, products, or new management approaches. This, in turn, can enhance CA.

Prior studies have shown that ES provides the foundation for various organizational competences, capabilities, and procedures. ES facilitates firms in capitalizing on novel opportunities (Cousins et al., 2011), thereby resulting in a CA. In the capability, learning, and innovation perspective, ES is considered as just one factor among many in a broader context. Expanding study on ES in these specific areas can enhance our comprehension of how ES affects SMEs' innovative performance and CA. This study has found research that focuses on innovation resulting from ES.

ES in the business context has so far been neglected by experts, and many have focused on the legal environmental context (Hidalgo & Centeno, 2023), ecologically sustainable (Xin & Ny Avotra, 2023), public health (Fraser et al., 2022; Kiss et al., 2023), manufacturing (Alatarvas et al., 2023). ES research in the SME context is significant to develop because it sees the rapid changes and developments in the business environment. Requires SMEs to join the flow of change and start shifting from conventional and digital-based. The use of digital media has transformed the business model of SMEs which simultaneously operate both conventional and digital businesses to expand their market reach. This opens up opportunities for SMEs to develop more quickly. So, the ES factor can not only be seen as part of the corporate mindset, but SME

owners or managers today must be more observant in paying attention to their business environment to be able to develop their CA.

Environmental evaluation significantly enhances an organization's capacity to effectively introduce new products and detect disruptive possibilities. Preliminary research indicated that employing information systems and implementing a structured process for gathering and analyzing external data enhanced the probability of achieving success with new products (Henard & Szymanski, 2001). Further studies have enhanced our understanding of this favorable correlation by revealing that created investigating environment sectors enhances both creativity and the promptness of product introduction (Yoo & Sawyerr, 2014). Moreover, presenting environmental issues as prospects is better suited to yield succeed in innovation than to presenting issues as hazards (Howel & Shea, 2021).

ES facilitates individuals in comprehending and capitalizing on various opportunities (Cousins et al., 2011). ES has been associated with successful product innovation (Blaique et al., 2024; Cáñez et al., 2007). Research on new product invention has demonstrated that the function of ES varies at different phases of the innovation process. ES plays a dual role in the innovation process. It aids in the production of ideas during the initial stages and helps to reduce uncertainty during the later stages (Börjesson et al., 2006). ES activities are commonly recognized as a crucial element of entrepreneurial alertness, which refers to the capacity to recognize and take advantage of emerging possibilities (J. Tang et al., 2012). Therefore, this study supports the claim that a greater awareness of CA can be attained by analyzing how firms interpret signals from ES and then convert them into creative processes, products, and/or new managerial techniques. Strategic management study highlights the significance of ES.

Limitations and future research

The current study has several limitations, which point to future research directions. The population of this research is limited, namely only carried out on SME managers in the city of Padang, West Sumatra. Therefore, it would be better if further research could be carried out on a wider population in order to get a more varied perspective on the research results from the respondents. Then, this research only discusses the influence of ES and innovation variables to measure the ability of SMEs to achieve CA. Thus, further research is recommended to discuss other relevant factors that can influence SMEs in building CAs such as organizational resilience, market orientation or others.

Furthermore, this research is cross-sectional, which limits its ability to accurately capture the dynamic nature of research variables. Hence, researchers propose carrying out forthcoming investigations using longitudinal designs to capture patterns in outcomes. Furthermore, this study specifically examines small and medium-sized enterprises (SMEs), suggesting that future research may provide contrasting findings if larger organizations are included in the sample. In addition, experts contend that organizations must also address changes in the behaviour of their leaders and staff, in addition to implementing scanning measures. Research findings indicate that the extent to which managers are receptive to the organizational environment and their understanding of external cues and information has an impact on the level of interaction, adaptability, and innovation capabilities of small and medium-sized enterprises (SMEs), ultimately affecting their competitiveness relative to other companies. With a mere 142 samples, the researcher suggests that future studies should consider include a larger sample size. This would allow for a more extensive analysis and input from the respondents.

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