

**INFORMATION TECHNOLOGY CAPABILITIES AND ENTERPRISE
RESILIENCE OF STATE-OWNED ENTERPRISES FOR SUSTAINABLE
COMPETITIVENESS: THE MEDIATING ROLE OF LEADERSHIP CAPABILITIES**

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ABSTRACT

Background and Purpose: Business resilience depends on the ability to gather and process resources to handle environmental uncertainty. Enterprises should use information, knowledge, experiences, and other resources to build resilience. This study applies the concept of dynamic capability to assess the impact of Information Technology Capabilities (ITCs) on Indonesian SOEs and their subsidiaries. Additionally, this study investigates Leadership Capabilities (LCs) as a mediator between Information Technology Capabilities (ITCs) and Enterprise Resilience (ER).

Methodology: The study examined 322 valid data from online surveys using questionnaires to Indonesia SOEs and their subsidiaries' board of directors and senior management. The data was analysed using SmartPLS 3.

Findings: The research demonstrates that information technology capabilities (ITCs) enhance Enterprise Resilience (ER). Leadership Capabilities (LCs) improved the enterprise's resiliency. The relationship between Information Technology Capabilities (ITCs) and Enterprise Resilience (ER) is mediated through Leadership capabilities (LCs).

Contributions: The findings may expand the scope of dynamic capability theory to include resilience. The findings extend the methodology by adopting a quantitative and online survey of SOEs in emerging countries and demonstrate to SOE management and regulators that ER can be fostered by strengthening dynamic capabilities and risk management practices. The findings recommend that policymakers develop a road map, scenario, and strategies to ensure the long-term viability of SOEs.

Keywords: Dynamic capabilities, enterprise resilience, Indonesia, information technology capabilities, leadership capabilities, state-owned enterprises.

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1.0 INTRODUCTION

In the dynamic and rapidly changing market condition, every company is susceptible to adverse events (Fiksel et al., 2015; Ponomarov & Holcomb, 2009; Sabahi & Parast, 2019). As a result, understanding how businesses can overcome adversity has become an important topic for academics and professionals (Parast & Shekarian, 2019; Sabahi & Parast, 2019). Enterprise Resilience (ER) consists of two important components: (1) resistance capacity, the capacity of a system to reduce the consequences of a disruption by preventing it or by reducing the time between the commencement of a disruption and the start of the recovery from that disruption; and (2) recovery capacity, the ability of a system to establish a direction to revert to a stable state of features and functions after a disturbance has occurred (Sabahi & Parast, 2019).

Dynamic capabilities (DCs) ensure that an organisation's assets and capabilities correspond with its dynamic environment (Drnevich & Kriauciunas, 2011) by reallocating, modifying, integrating, and reconfiguring essential resources and abilities to capitalise on new opportunities (Helfat et al., 2007; Teece, 2007; Teece et al., 1997). DCs are an enterprise's

ability to consolidate, develop, and reorganise internal and external capabilities in proposed solutions to unforeseen circumstances. The organisation must possess DCs to flourish in an unstable and dynamic environment (Teece et al., 1997). DCs concentrate on two elements: first, a company's ability to adjust to a business climate that is constantly in flux, and second, the function of a company's strategy in modifying, integrating, and restructuring its resources, capabilities, and organisational skills to fit a dynamic setting. Eisenhardt and Martin (2000) broadened the concept to encompass the release of resources in response to external shocks, which results in market volatility. Cepeda and Vera (2007) and Winter (2003) differentiated standard operational capability and higher-level DCs. Dynamic businesses can adjust to new circumstances and create new resource combinations (Giniuniene & Jurksiene, 2015).

Teece (2007) stated that a firm's dynamic capabilities allow it to utilise its assets to operate regularly in an ever-changing environment. Companies must depend on reliable and trustful information provided by soft and hard infrastructures to remain adaptive and competitive. Thus, companies need ITCs, defined as "the capacities to develop and utilise IT-based resources in conjunction with other resources and competencies" (Bharadwaj, 2000, p. 171). Consequently, only organisations utilising their resources (IT infrastructure, IT human capital, and IT-enabled intangible assets) and IT investment will achieve competitiveness and enhanced corporate performance by differentiating themselves from their competitors. According to Majhi and Mukherjee (2019), firms' ITCs will allow them to maximise the value of their investments in information systems and information technology. In organising effective and efficient ITCs, companies need an entrepreneurial trait dependent on the leader. The function of the leader is critical in this regard. Leadership is crucial to an organisation's dynamic capabilities development and management (Schoemaker et al., 2018).

In the era of rapid technological changes and advancement, the ability of businesses to organise their information technology assets, competence, and comprehension cohesively plays a significant role in accomplishing outstanding results (Stoel & Muhanna, 2009; Powell & Det-Micallef, 1997; Ray et al., 2005). This organisational proficiency is known as the information technology capabilities (ITCs) (Stoel & Muhanna, 2009; H. Liu et al., 2015). In this vein, several studies demonstrate that better results are achieved by constructing and enhancing ITCs, instead of merely investing in IT resources (Stoel & Muhanna, 2009; Powell & Det-Micallef, 1997; Stratopoulos & Dehning, 2000). However, there are relatively few empirical findings regarding the association between ITCs and ER in the public sector context

in emerging countries (Pang et al., 2014).

With their capabilities, leaders' role is crucial in ensuring the organisation's robustness and achieving its objectives (Zahari et al., 2022). Leaders have the trust to motivate employees to empower organisations' corporate philanthropic goals (Abdillah et al., 2021). LCs are the portion of DCs that comprise, among other things, entrepreneurial awareness, creativity, and human activity (Di Stefano et al., 2014). LCs are a managerial function that influences the activities, behaviours, and, subsequently, the outcome or profitability of businesses (Sharif & Irani, 2012). Shin and Park (2021) characterised LCs as leadership-driven, risk-proportional capability management. Leaders can influence the organisation's general structure through decision-making that ensures the enterprise's resilience (Suryaningtyas et al., 2019). Shin and Park (2021) studied top management's contribution to developing resilience in the supply chain in Korea. Their research expands our insight into the leaders' contribution and importance in developing and enhancing dynamic and managing enterprise capabilities supported by leadership, which create robust and solid enterprises. The findings indicate leadership's vital function in improving resilience components (adaptability, agility, effectiveness, and vigilance).

SOEs exist both in advanced and emerging economies (Heo, 2018). SOEs were formed to handle the issue resulting from market failure (Shleifer & Vishny, 1994). SOEs were a success in some nations but a massive failure in others (Koch, 2016). Due to their significant role in society and their responsibility to taxpayers, the resilience of SOEs is a source of concern for stakeholders because it could lead to severe problems for the national economy. As a result, improving the performance of SOEs remains important to policymakers (Heo, 2018). SOEs make a significant contribution to Indonesian economic growth. SOEs have made and will continue to contribute to the Indonesian economy significantly. The Constitution requires the State to participate in crucial industries and natural resource management (Khatri & Ikhsan, 2020).

SOEs in Indonesia are enterprises in which the government owns at least 51% of the total shares. The Indonesian government actively encourage state-owned businesses to revitalise industrialisation, infrastructure development, manufacturing expansion, and downstream resource sectors (Kim & Sumner, 2021). These SOEs' performance, resilience, and sustainability are critical, as their failure would harm the country's social and economic prosperity (International Finance Corporation & World Bank Group, 2018). The resilience and

sustainability of Indonesia's SOEs and subsidiaries are essential to the national economy. Despite some success, some Indonesia SOEs are threatened to disappear, shrink, or even go bankrupt due to technological advancements, rapid changes in business models, and a lack of DCs (Idhom, 2017).

Therefore, this research investigates the role of ITCs and LCs in the ER and the role of LCs as mediators in the relationship between ITCs and ER. The pertinent research questions are:

- 1) Do ITCs influence ER?
- 2) Do LCs influence ER?
- 3) Do ITCs influence LCs?
- 4) Do LCs mediate the relationship between ITCs and ER?

For this purpose, an SEM-PLS model is proposed to analyse 322 responses from the Board of Directors (BODs) and Senior Management of Indonesian SOEs and their subsidiaries. The findings may have an impact on organisational practice and research. This study is novel since it examines ER from the dynamic capability theory. The scope is different from that of the previous study since the unit of analysis is the whole of SOEs and their subsidiaries in the emerging country, Indonesia. It demonstrates that ITCs and LCs are significant antecedents of ER. This study provides recommendations for policymakers and management of Indonesia SOEs and their subsidiaries to create and expand ITCs and LCs with more comprehensive skills to effectively contribute to the creation and enhancement of ER.

This study is structured into parts. The following part is the literature review that will provide the foundation of the research. The adopted hypotheses and conceptual model are also presented in this section. The following is an explanation of the methodology used in this study. Then, the findings and the discussion were presented. This paper concludes by presenting implications, limitations, and recommendations for future researchers. The research framework for this study is presented in Figure 1.

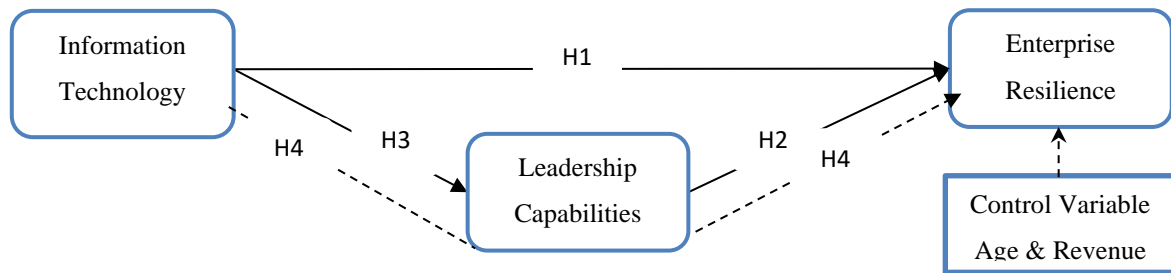


Figure 1: Research framework

2.0 LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1 Enterprise Resilience and Dynamic Capabilities

Organisations must have dynamic capabilities in an erratic and unpredictable business environment to ensure their resilience. Innovative and agile companies can identify valuable combinations of capabilities and resources by leveraging dynamic capabilities. Dynamic Capabilities permit the identification of new products and services, enabling competitors to enter previously untapped markets (Schoemaker et al., 2018). Rangachari and Woods (2020) conclude that dynamic capabilities could help companies build resilience if they possess the relevant capabilities.

Several previous studies, such as those of Coutu (2002) and Hamel and Välikangas (2003), have suggested a relationship between dynamic capabilities and ER, which is referred to as the capacity to reduce fragility, change and adapt, and recover from unanticipated disasters (Erol et al., 2010b). This concept aligns with Teece et al. (1997) notion of DCs (the capacity of organisations to incorporate, develop, and rearrange their abilities in response to environmental and organisational changes). Thus, businesses are dynamic generators of capability, focused on overcoming adversity, learning from it, and achieving the flexibility necessary for expansion, establishing a more stable structure, and maintaining. This statement clarifies the connection between resilience and dynamic capabilities.

Xiao and Cao (2017) construct a theoretical model explaining how businesses can adapt to the disruption that threatens their existence in the market. The research of Vargas and Rivera (2019) emphasises the significance of dynamic abilities in fostering resilience. The findings reveal a clear relationship between corporate resilience and dynamic capabilities by examining three crucial moments a turbulent organisation must overcome to exist sustainably. First, it is

the time when the enterprise's actions lead up to its catastrophic state, illuminating the underlying causes of the second moment. The last phase reveals the enterprise's business approaches to resolving the calamities and the steps to ensure its success.

2.2 Information Technology Capabilities and Enterprise Resilience

Businesses must rely on trustworthy information from soft and hard infrastructures to remain flexible and competitive. These information infrastructures enable the gathering and processing vast quantities of data from various sources (Ciampi et al., 2018). Therefore, technology capability is crucial for an enterprise's survival and continued existence. Possessing the most recent technology is no longer a prerequisite for business success; what makes a difference is how the technology is utilised to benefit the company. ITCs development can majorly affect a business's success (Bhatt, 2000). The increasing use of digital services and smartphone access to digital markets will prompt businesses to re-evaluate their technological capacities. A company's asset base must be rebuilt to adapt to new technologies and markets. ITCs positively impact organisational inventiveness, which drives productivity and competitive advantage (Marchiori et al., 2022). Kim et al. (2011) found evidence of positive and significant relationships between IT capabilities and an organisation's financial performance.

Liu et al. (2015) examined the mechanisms of influence of ITCs from the dynamic capabilities perspective. They discovered that ITCs Promote the growth of supply chain flexibility and adaptability, consequently impacting the resilience and results of the company. There are contradictory results in the previous research about the relationship between ITCs and business promptness. IT is viewed as a facilitator of promptness, enabling quicker decision-making and promoting internal communications (Lu & Ramamurthy, 2011). They found an association between ITCs and business agility. Panda and Rath (2016) examined the apparent contradiction between ITCs and organisational agility. They determined that ITCs facilitate the business process and organisational flexibility.

Nonetheless, if IT investments are not effectively directed to boost performance, they might even have a detrimental effect on the responsiveness of the business. ITCs are a crucial business competency. ITCs enable enterprises to integrate other corporate resources and competencies.

H1: There is a significant relationship between Information Technology Capabilities (ITCs) and Enterprise Resilience.

2.3 Leadership Capabilities and Enterprise Resilience

Strong leadership is essential for the success and longevity of businesses. Strong leaders assist their employees in maximising their potential, provide the enterprise with an opportunity to succeed, inspire individuals to do their utmost for collectives more than their objectives and assist organisations in adjusting by eliminating inefficient habits (McColl-Kennedy & Anderson, 2002; Taylor et al., 2014). Strong and agile leadership combines the traits and talents of leaders who change, immediately modify the entire company, and modify the organisation's operations to a competitive marketplace (Dartey-Baah, 2015). Agile leaders can recognise when something is not working, pivot swiftly, make decisive decisions, and resolve issues.

Organisations need new business models, DCs, and strategic leadership to prosper in VUCA (Vulnerable, Uncertain, Complex, Ambiguity) environments (Schoemaker et al., 2018). Management may be confronted with unanticipated circumstances requiring fast adjustments. Executives who grew up in a more predictable era might find the current environment challenging. They adhere to a forecast-based plan, limiting them to straightforward projections derived from standard budgeting and forecasting approaches. The administration may learn to maintain quantifiable risk rather than high uncertainty.

H2: There is a significant relationship between Leadership Capabilities and Enterprise Resilience

2.4 Information Technology Capabilities and Leadership Capabilities

Through the lens of DC analysis, Lim et al. (2012) found a favourable relationship between the power of IT leaders and the possibility that the enterprise would produce more ITCs. Moreover, the researchers discovered that the importance of ITCs to a firm's competitiveness is larger in companies where IT leaders have more power. Several studies have revealed that ITCs can provide businesses with benefits, such as enhancing business functions, enhancing organisational performance and inventiveness, and developing competitiveness (Bharadwaj, 2000; Chen & Tsou, 2012; Kim et al., 2011; Lu & Ramamurthy, 2011). ITCs rely heavily on technical expertise (hard skills), communication competency (soft skills), and relationship

skills (as part of leadership qualities) (Ravichandran & Lertwongsatien, 2005). Expert leaders decide the information technology implemented in the companies (Hult et al., 2004).

H3: There is a significant relationship between Information Technology Capabilities and Leadership Capabilities

2.5 Information Technology Capabilities, Leadership Capabilities, and Enterprise Resilience

Companies need dynamic and technological capabilities to improve corporate performance and sustainability. Agile leadership establishes goals, develops procedures and standards, and encourages appropriate behaviour. In Indonesia, technological capabilities, dynamic capabilities, and agile leadership influence innovation ambidexterity and the resilience of start-up businesses (Aldianto et al., 2021). The organisational capabilities of executives, the effectiveness of transmitting information, the relationships with clients, the partnership capability among firms, and the crisis management capability substantially affect resilience (Zhang et al., 2021).

H4: Leadership Capabilities mediate the relationship between Information Technology Capabilities and Enterprise Resilience

3.0 METHODOLOGY

This study investigates the effect of ITCs and LCs on the ER of Indonesian SOEs and their subsidiaries. Indonesia was chosen as a context since it is one of the biggest and most active countries in the global economy. With an almost 280 million population, Indonesia has become a prospective market for various business sectors, and the Indonesian economy relies heavily on SOEs (Khatri & Ikhsan, 2020).

This study employed a quantitative cross-sectional survey design. To acquire perspectives at the institutional level as a unit of observation, the authors focused on BOD members and senior management of all SOEs and their subsidiaries, available on the Indonesia Ministry of SOEs and each SOE's website. A structured questionnaire, in both English and Bahasa Indonesia, was utilised to obtain survey data. Due to the outbreak of COVID-19 and confinement regulations, this research employed an online questionnaire. The online survey

was created using Google Forms, a cloud-based survey application. The authors use the Partial Least Squares - Structural Equation Modelling (PLS-SEM) method with a reflective measurement model using SmartPLS 3 software to analyse data and test hypotheses (Hair, 2014). Descriptive statistics and preliminary tests were executed, including common method bias and collinearity.

All indicators are from previous research. To measure Enterprise Resilience (ER) we adopted fourteen (14) indicators (Erol et al., 2010a; Lee et al., 2013; McManus, 2008; Stephenson, 2010; Stephenson et al., 2010). Eleven indicators were used to measure Leadership Capabilities (LCs) (Aziz et al., 2015; Goh & Richards, 1997; Kivipõld et al., 2010; Kivipõld & Vadi, 2008; Schweitzer, 2014). Information Technology Capabilities (ITCs) were assessed using nine indicators (Bhatt & Grover, 2005; Said et al., 2010; Tanriverdi & Cemal, 2006; Tippins & Sohi, 2003). The measurement was operationalised using a seven-point Likert scale ranging from strongly disagree to strongly agree. When a Likert scale is judged symmetrical and equidistant in its responses, it will act more like an interval scale. As a result, even if a Likert scale is ordinal when presented properly, it can resemble an interval-level assessment, and the related variables can be used in SEM. (Hair et al., 2018).

This research employed company size (three-year average revenue) and company age as control variables. It was discovered that these two variables affected enterprise performance or survival (Jiang et al., 2020; Mafabi et al., 2015). Before dissemination to respondents, the questionnaire was validated by the boards of directors of 31 SOEs and five academics to guarantee its quality and applicability. The final questionnaire included advice and suggestions from experts. The study was undertaken for two months, from June to August 2020. The population consisted of 644 corporates with 114 SOEs and 530 subsidiaries. The authors used social media (WhatsApp) with the snowballing approach to collect adequate samples. There are 322 valid responses.

4.0 RESULTS

Before analyzing the PLS SEM assessment using SmartPLS 3 (Ringle et al., 2015), we did four preliminary tests, and the results were non-normal distributed data, with no evidence of common method bias. There are no collinearity and non-response bias issues.

4.1 Descriptive Statistics

Table 1: Enterprise profile

Variables	Categories	Frequency (<i>n</i> : 322)	%
Age	1 – 10 years	73	22.67
	More than 10 – 20 years	47	14.60
	More than 20 – 30 years	46	14.29
	More than 30 – 40 years	24	7.45
	More than 40 – 50 years	44	13.66
	More than 50 years	88	27.33
Size (Average revenue in the last 3 years - Billion IDR)	Less than and equal to 1,000	154	47.8
	1,001 – 10,000	114	35.4
	More than 10,000	54	16.8

The respondents' ages are diverse, from the young enterprises (less than 10 years old) to the old (more than 50 years old). This means the old could stay in business for long periods, and the young enterprises keep coming. The majority of SOEs and their subsidiaries are Small and medium.

Table 2: Respondents' profile

Variables	Categories	Frequency (n:322)	%
Gender	Male	274	85.09
	Female	48	14.91
Age	Below 30 years	4	1.24
	30 – 40 years	41	12.73
	41 – 50 years	120	37.27
	Above 50 years	157	48.76
Position	CEO	99	30.75
	Finance & Risk Director	59	18.32
	Others Director	56	17.39
	Senior Manager	108	33.54
Education	Doctor / PhD	12	3.73
	Master	173	53.73
	Degree/ Bachelor	134	41.61
	Diploma 3 or below	3	0.93

The majority of SOE executives are male. Indonesia Ministry of SOEs has established a program to increase the participation of women at the executive level. Their educations are quite high since more than 50% have at least a Master's degree.

4.2 Assessment of Measurement Model

Table 3 exhibits reliability, validity, and model fit. The internal consistency values using Composite Reliability and the convergent validity (AVE) are considered satisfactory.

Table 3: Reliability, validity, and model fit

Construct	Reliability (CR)	Validity (AVE)	Model fit (SRMR)
ER	0.948	0.568	0.070
ITC	0.946	0.662	
LC	0.949	0.630	

All the HTMT ratios were below 0.90, suggesting that discriminant validity is present (Henseler et al., 2015; Kline, 2011).

4.3 Assessment of Structural Model

Figure 1 shows the path model. All factor loadings are higher than 0.6, with AVE higher than 0.5 (see Table 4). Suggesting that the constructs account for more than half of the variance in the underlying construct (Hair et al., 2019).

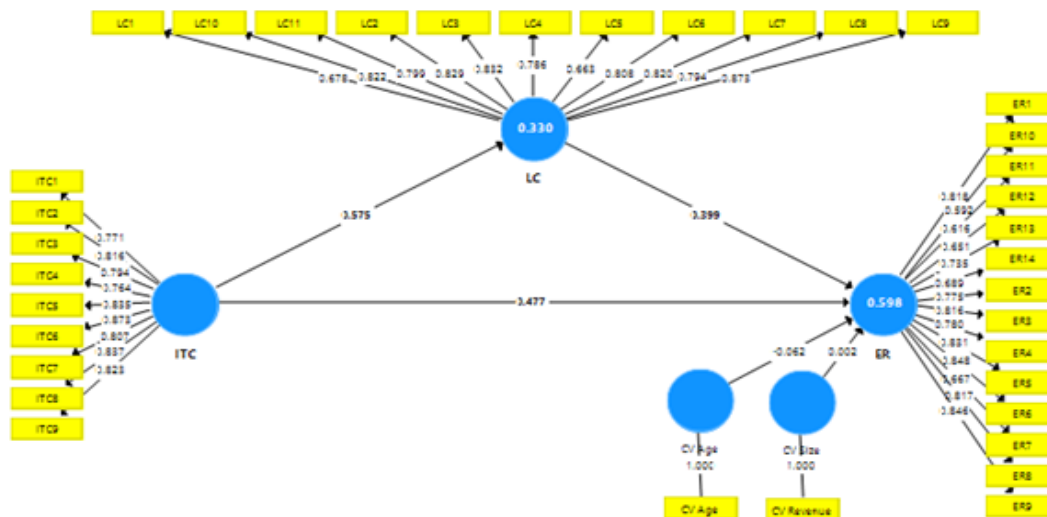


Figure 1: Path model

There are no collinearity issues since all inner VIF values are lower than 3 (Hair et al., 2018). Table 4 shows the prediction capacities of the model and the links between the constructs. The R^2 value for LC is 0.330, and the R^2 value for ITCs is 0.598. Thus, ITC explained 59.8% of the variance of ER, and LCs explained 33% of the variance of ER. The coefficient of determinant LC and ER is moderate. The effect size of the predictor relationship (f^2 value) ITC to ER is 0.372 (substantial), ITC to LC is 0.493 (large), and LC to ER is 0.264 (medium) (Cohen, 1988).

The predictive relevance of the PLS path model (Q^2) is higher than zero, thus the model has predictive relevance (Hair et al., 2019).

Table 4: Structural model assessment

	R²	f²	Q²
LC	0.330		0.200
ER	0.598		0.331
ITC \square ER		0.372	
LC \square ER		0.264	
ITC \square LC		0.493	

4.4 Hypotheses Test

All hypotheses are supported, as shown in Table 5.

Table 5: Hypotheses test

Hypothesis	β	SD	t-value	p-value	Decision
H1: ITC \square ER	0.398	0.059	6.750	0.000	Supported
H2: LC \square ER	0.421	0.060	7.023	0.000	Supported
H3: ITC \square LC	0.715	0.033	21.588	0.000	Supported
H4: ITC \square LC \square ER	0.284	0.045	6.354	0.000	Supported

This study's first hypothesis (H1) indicated that ITCs have a direct and significant impact on ER. The model demonstrated that ITCs accounted for 39.8 per cent of the variance in ER. The outcome is consistent with prior research (Ciampi et al., 2018; Liu et al., 2015; Marchiori et al., 2022; Panda & Rath, 2016). This finding indicated that SOEs and their subsidiaries must devote, build, and strengthen ITCs to proactively detect, capture opportunities, and transform enterprises' resources to create more agile enterprises. Enterprises must establish robust IT teams and infrastructure to develop and improve ER.

The second hypothesis (H2) proposed that LCs have a positive effect on ER. In this sense, LCs explained 42 per cent of the variance in ER. Consequently, hypothesis 2 was supported and in line with previous studies (Dartey-Baah, 2015; McColl-Kennedy & Anderson, 2002; Schoemaker et al., 2018; Taylor et al., 2014). In this regard, organizations must enhance their leaders' capabilities through learning, training, benchmarking, and facilitating the exchange of external expertise. The Ministry of SOEs current policy to increase the number of BOD and senior executives from professional backgrounds is one of the strategies to enhance leadership with rich capabilities.

The third hypothesis (H3) proposed that ITCs directly influence LCs. Thus, companies'

ITCs will support leaders in enhancing their capabilities. This hypothesis is supported, as suggested by previous literature (Lim et al., 2012; Chen & Tsou, 2012; Kim et al., 2011; Lu & Ramamurthy, 2011; Ravichandran & Lertwongsatien, 2005). The fourth hypothesis proposed that LCs mediate the relationship between ITCs and ER. This result strengthens previous studies were done by Aldianto et al. (2021) and Zhang et al. (2021)

5.0 DISCUSSION AND CONCLUSION

This study aimed to investigate the connection between IT capabilities and ER. Consequently, IT capabilities are one of the fundamental inputs required for the development and enhancement of ER. In addition, the study demonstrated that leadership capabilities serve as mediators between IT Capabilities and ER. In line with the government's (the Ministry of SOEs) goal to create world-class Indonesia SOEs, and in coping with high uncertainties and a very dynamic business environment - DCs are valuable tools to develop and enhance ER. This study proposes the extension of literature on enterprise resilience as viewed through the lens of dynamic capabilities (Annarelli & Nonino, 2016; Dweck, 2016; Nachbagauer & Schirl-Boeck, 2019; Slagmulder & Devoldere, 2018). It also extends the limited literature on enterprise resilience in SOEs in emerging markets (Mancesti, 2017).

The study will enrich the research on DCs and ER since these studies used SOEs and their subsidiaries from an emerging and dynamic country (Indonesia) that operates in various industries. From a practical point of view, this Shed light on the understanding that ER could be developed and enhanced by developing DCs. The findings suggest the Ministry of SOE do a mapping exercise and gap analysis on DCs and ER on SOEs to improve their chance of sustainability. The findings provide information for regulators and policymakers to develop the roadmap, scenario, and strategies required to ensure Indonesia SOEs' long-term viability and create world-class Indonesia SOEs. The findings could also be used to develop resilience assessment tools for each SOE sector.

The breakdown of ITCs and LCs that contribute to the development and improvement of ER is suggested for future research. In addition, the study examines ER from a new angle, focusing on dynamic capabilities in hybrid organisations, which are SOEs in emerging markets. This study helps policymakers understand the relationship between ITCs, LCs, and ER for strategy development. IT's capacity for information gathering and analysis can be utilised by top management in the public sector to formulate and implement sound strategies and policies.

However, the limitations of the present study may prevent the generalisation of the outcomes and findings. Data were perceptual data, which may have introduced bias. Future researchers can, therefore, utilise alternative research methods, such as data from the published report, multiple informants, and longitudinal data. Moreover, the study centred on Indonesian SOEs. Given these variations between the public and private sectors, the results and conclusions of the research should be evaluated cautiously. Still, they do offer an avenue for comparative study. Hence, we suggest that future studies cover different countries and types of business ownership.

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APPENDIX

The Survey (Questionnaire)

For each statement, please tick (✓) the number that best represents your level of agreement/disagreement by using the following scale.

Strongly disagree.	Disagree	Somewhat disagree.	Neutral	Somewhat agree.	Agree	Strongly agree.
①	②	③	④	⑤	⑥	⑦

SECTION 1: LEADERSHIP CAPABILITIES

The following questions seek to measure Leadership Capabilities (LC) in your organization.

1	Our organization leaders do not resist change and are not afraid of new ideas.	①	②	③	④	⑤	⑥	⑦
2	Our organization leaders ensure proper strategies are in place	①	②	③	④	⑤	⑥	⑦
3	Our organization leaders ensure strategies are aligned with our vision, values, and objectives.	①	②	③	④	⑤	⑥	⑦
4	Our organization leaders are forward-looking	①	②	③	④	⑤	⑥	⑦
5	Our organization leaders have strong global business exposure	①	②	③	④	⑤	⑥	⑦
6	Our organization leaders comprise individuals with various skills, experience, knowledge, and expertise	①	②	③	④	⑤	⑥	⑦
7	Our organization leaders think and act strategically to ensure that our organization is always ahead of competitors.	①	②	③	④	⑤	⑥	⑦
8	Our organization leaders have developed a strong alliance with national leaders and the community.	①	②	③	④	⑤	⑥	⑦
9	Our organization leaders ensure policies, processes, and resources are available to support plans	①	②	③	④	⑤	⑥	⑦
10	Our organization leaders ensure employees know and act in line with agreed values, attitudes, and behaviors	①	②	③	④	⑤	⑥	⑦
11	Our organization leaders track performance and give employees feedback on their performance	①	②	③	④	⑤	⑥	⑦

SECTION 2: INFORMATION TECHNOLOGY CAPABILITIES

The following questions measure Information Technology Capabilities (ITC) in your organization.

1	Every year our organization budgets a significant amount of funds for new information technology advancement	①	②	③	④	⑤	⑥	⑦
2	Our IT Department is linked with Risk Department	①	②	③	④	⑤	⑥	⑦
3	The technology infrastructure links our organization with external business partners (i.e., key customers and suppliers)	①	②	③	④	⑤	⑥	⑦
4	Our organization utilizes big data in making decisions	①	②	③	④	⑤	⑥	⑦
5	Our organization has backup IT Facilities	①	②	③	④	⑤	⑥	⑦
6	Our organization possesses a high degree of information technology expertise	①	②	③	④	⑤	⑥	⑦
7	Our organization has given considerable training opportunities for staff members to enhance their IT knowledge.	①	②	③	④	⑤	⑥	⑦
8	Our organization's IT system is more advance than our competitors	①	②	③	④	⑤	⑥	⑦
9	Our organization is capable of protecting the company from cyber hackers.	①	②	③	④	⑤	⑥	⑦

SECTION 3: ORGANIZATIONAL RESILIENCE

The following questions seek to measure Enterprise Resilience (ER) in your organization.

1	Our organization is able to respond to unexpected business challenges	①	②	③	④	⑤	⑥	⑦
2	Our organization closely collaborates with others in the industry to manage unexpected challenges.	①	②	③	④	⑤	⑥	⑦
3	Our organization has a clear strategy for the role of each employee in managing an unexpected challenge	①	②	③	④	⑤	⑥	⑦
4	Our organization has a backup plan during the key people are unavailable	①	②	③	④	⑤	⑥	⑦
5	Our organization is able to absorb the negative impacts of a financial crisis.	①	②	③	④	⑤	⑥	⑦
6	Our organization is able to cope with new competitors with more advanced strategies	①	②	③	④	⑤	⑥	⑦
7	Our organization has a formal written business continuity plan.	①	②	③	④	⑤	⑥	⑦
8	Our organization equips employees with the information and knowledge they need to respond to unexpected problems that arise.	①	②	③	④	⑤	⑥	⑦
9	Our organization is agile in taking required action when needed.	①	②	③	④	⑤	⑥	⑦
10	EBITDA growth	①	②	③	④	⑤	⑥	⑦
11	Return on investment	①	②	③	④	⑤	⑥	⑦
12	Product differentiation within the core business	①	②	③	④	⑤	⑥	⑦
13	Product and service innovation growth	①	②	③	④	⑤	⑥	⑦
14	Assets Recycling Capability	①	②	③	④	⑤	⑥	⑦