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Analysis Of Micro Fundamental Aspects Of Gradual Investment Patterns In Smes (Gradual Transformation From Incremental To Radical)

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ABSTRACT

Small and Medium Enterprises (SMEs) now mostly rely on digital transformation to stay competitive among technological upheaval. This study intends to investigate the impact of basic micro aspects—including organization, mechanization of information technology (IT) use, simple products, organizational structure, and owner involvement—on the slow investment pattern in the digital transformation of SMEs. Furthermore investigated in this paper is the moderating influence of cognitive response on this link. Data were gathered from 134 SMEs in Batam using a quantitative approach and purposive sampling technique by means of a validated and dependable Likert scale questionnaire and subsequently subjected to partial least squares (PLS) analysis. While direct owner involvement has no appreciable direct influence, the research findings show that organization, IT mechanization, simple products, and organizational structure greatly affect the gradual investment pattern. Nevertheless, the impact of owner involvement and IT mechanization becomes notable when controlled by cognitive reactions, so stressing the relevance of cognitive processes in digitalization decision-making.

Keywords: SMEs, digital transformation, gradual investment, micro aspects, cognitive response

INTRODUCTION

The transformation from incremental to radical innovation is crucial to improve competitiveness and business sustainability. According to Norliani et al. (2024), Digital transformation has the potential to fundamentally change the way organizations operate, improve operational efficiency, and increase employee productivity. By utilizing information technology wisely, organizations can achieve a significant competitive advantage in this increasingly digital business environment. In the last five years, businesses have undergone a significant shift to adapt to digital transformation (González-Varona et al., 2021). In meeting market demand, SMEs play a key role as the main source of innovation and creative technology (Yuwono et al., 2025), as well as providing reliable and skilled labour in the production process (Immanuel Zai et al., 2022). In maintaining competitiveness and supporting business sustainability, SMEs need to make investments as part of their business development strategy. Investment itself is a form of capital investment made by individuals or institutions with the aim of obtaining profits in the future. Investment is a commitment to allocate a certain amount of funds to an asset over a specific period to increase the added value of those funds in the future. In practice, investments can be made gradually, adjusted to the capital capacity and financial planning strategies of each entrepreneur (Yulfiswandi et al., 2022).

In Indonesia, Small and Medium Enterprises (SMEs) play an important role as the main pillar of the economy, providing significant contributions to GDP and job creation (Cuandra & Candy, 2024). Additionally, SMEs also contribute to improving community welfare (Aliyah, 2022). According to BKPM in 2021, they contributed 60.5% to the national GDP and absorbed 97% of the workforce in Indonesia. This shows that small and medium enterprises (SMEs) are very important in driving economic growth and community welfare (Anindita et al., 2021).

Sipa et al. (2015) state that SMEs play a crucial role in market development, both locally and internationally, by contributing to sustainable growth in the trade, production, and service sectors and attracting investment. Due to the increasingly competitive market, SMEs strive to assert their existence by developing new products to compete with large companies. However, SMEs still face several problems. This includes the lack of digitalisation, process management, investment, and human resource readiness, all of which contribute to difficulties in achieving profitability and sustainability (Straková et al., 2022). A comprehensive and integrated strategy is needed to improve the performance of SMEs to develop businesses and retain customers (Kurnia Fitriati et al., 2020). To face risks and sustainable development, SMEs must adapt to the new round of scientific and technological revolution, industrial transformation trends, and leverage the dividends of digital technology. They must also enhance their capabilities in rapid perception, agile action, and smart decision-making in the digital era (Teng et al., 2022).

Previous empirical studies and literature reviews have extensively investigated issues of digital transformation in SMEs. However, they tend to focus on specific topics

separately, such as the integration of new technologies (Koumas et al., 2021), financing limitations (Guo et al., 2023), supply chain management (Preindl et al., 2020), and other aspects. There are few studies that consider business aspects comprehensively to propose key success components for SMEs in facing digital transformation, but SMEs must consider all these aspects simultaneously after they decide to digitalise their business.

Therefore, the aim of this research is to identify the key components that determine the success of transformation in small and medium enterprises (SMEs), as well as to develop a strategic framework for digital transformation. This provides deeper insights into the key components that play a role in the digitalisation of SMEs. Additionally, the novelty of this research lies in the integration of fundamental micro-business factors (organisation, IT mechanisation, simple products, organisational structure, and owner involvement) with cognitive responses in influencing the gradual investment patterns in SME digital transformation, as well as highlighting the direct and indirect relationships of these elements in the transition from incremental to radical investments.

THEORETICAL FRAMEWORK AND EMPIRICAL STUDIES

The Impact of Organizations on Gradual Investment Pattern

The value creation process of SMEs exhibits organisational features, which have different strategic requirements and drivers compared to larger organisations (Cosenz & Bivona, 2021). Therefore, radical innovation is considered to have the greatest impact on the performance of SMEs (Ato Sarsah et al., 2020; Garzoni et al., 2020). The theory of diffusion of innovation focusses on the determinants of technology adoption both at the individual and organisational levels. Where the organisational aspects affected by the implementation of technology include the characteristics of organisational structure, communication processes, and internal resources (Omrani et al., 2024). Digital transformation marks a significant change in the operational paradigm of organisations in the contemporary business environment. Digital transformation goes beyond mere adoption of digital technology, encompassing a comprehensive overhaul of business culture, processes, and strategies to build and maintain competitive advantage in the digital era (Natalia & Hermawan, 2024). Digital transformation enhances business perception (Zhang et al., 2021). Li (2020) shows that digital technology can enhance information processing capabilities and organisational agility. Digital transformation enables organisations to develop new business models and new organisational forms to address these social challenges using operational models that are financially sustainable and scalable, generating profits and positive impacts that are difficult to achieve without the support of digital technology. Based on the explanation above, the hypothesis that can be developed is

H1: Organisations have a significant impact on gradual investment pattern.

The Impact Mechanization of IT use on Gradual Investment Pattern

The rapid development of digital technologies such as artificial intelligence, big data, cloud computing, blockchain, and the internet (Omrani et al., 2024) has attracted the attention of all industries because it causes a radical reconfiguration of organisational and strategic models of companies (Garzoni et al., 2020). Digital transformation has become an integral mechanism for companies to achieve breakthrough innovation and sustainable development (Zhang et al., 2021). The digitalisation of SMEs is defined as the integration of IT into the business practices of SMEs, which can yield valuable benefits for the success and resilience of SMEs (Anggraeni et al., 2023). SMEs have a very good opportunity to gain benefits from IT investments due to their simple business structure (Sagala & Őri, 2024). By using cutting-edge technology, SMEs can enhance their capabilities and continue to compete globally, enabling businesses to diversify and reach global markets (Peter et al., 2023). This is also explained in the research conducted by (Grooss et al., 2022). which shows that the mechanisms of information technology are the most important for SMEs, where coherent system integration and efficient information flow support the business in its core activities. Based on the explanation above, the hypothesis that can be developed is

H2: Mechanization of IT use have a significant impact on gradual investment pattern.

The Influence of Simple Product on Gradual Investment

Digital transformation primarily involves the transformation of an organisation and the processes occurring within it to present a new approach to products, customers, or services (Šimberová et al., 2022; Ziółkowska, 2021). SMEs focus their specialisation on offering a variety of products/services that are highly market-oriented, which means the implementation of a simpler value creation process (Cosenz & Bivona, 2021). The creation of products with simpler innovations is considered to reduce operational costs and present an opportunity for increased investment (Osano, 2023). The development of simpler products can provide the small and medium-sized enterprise sector with differentiated or low-cost alternative products compared to their competitors, which enhances their competitive advantage in the market (Liu & Wang, 2022). The development of simple products can serve as an initial step in innovation, allowing companies to attract investor attention and increase the potential for incremental investment (Chonsawat & Sopadang, 2020). According to research by Light & Fernbach (2024), a simple product perceived as conceptualised by consumers as the dimensionality of brand representation implies that manipulating simplicity or complexity will affect the size of dimensionality, and vice versa. This is relevant for gradual investment, as companies can assess the potential of a product through a phased approach, reducing the risk of failure due to large initial investments. Based on the explanation above, the hypothesis that can be developed is

H3: Simple product have a significant impact on gradual investment pattern.

The Influence of Organizational Structure on Gradual Investment Patterns

Organizational structure is an important factor in determining gradual investment patterns (Natalia & Hermawan, 2024). Many theories consider organisational structure as a series of positions and parts of the organisation that develop systematic and relatively enduring relationships (Marín-Idárraga & Hurtado González, 2021). Strong adoption and change management are inseparable parts, involving process changes, user training, and planning for adoption and scaling from the outset ((Fleaca et al., 2022). Therefore, these companies usually adopt a flat organisational structure with fewer managerial layers, allowing closer employee interactions and quick responses to competitor actions and market condition changes (Cosenz & Bivona, 2021) because the implementation of digital technology has strategic and operational drivers (Omrani et al., 2024) that make decision-making at the managerial level crucial. The organisational structure and regulated processes enhance the strength of the relationship between the application of Industry 4.0, IT implementation, and future business performance (Philbin et al., 2022). A comprehensive change management strategy that combines strategic, tactical, and operational elements is necessary to effectively guide the transition. Involving employees through participatory structures and creating a sense of ownership in the transformation process is crucial for success (Okorie et al., 2023). Based on the explanation above, the hypothesis that can be developed is

H4: Organizational structure have a significant impact on gradual investment pattern.

The Influence of Managed Directly by The owner on Gradual Investment Patterns

Direct management by the owner is a common characteristic in Small and Medium Enterprises (SMEs) that influences various aspects of decision-making, including the gradual investment strategy (Rasmawati et al., 2024). Bouncken & Schmitt (2022) show that families owning family businesses are a driving force behind initiating radical innovations and company renewal. Ownership has been recognised as the foundation of corporate governance because a company cannot stand alone without an owner, and the rights of share ownership are granted to the owner (Chatterjee & Bhattacharjee, 2020). Research conducted by Alam et al. (2022) revealed that the increasing level of digital technology adoption among SMEs in Australia can be seen by owners/managers as an opportunity to create an environment where they can better capitalise on opportunities. SME owners who are directly involved in managing the company also tend to have greater control over the digital transformation process, which can enhance operational efficiency and minimise investment risks (Nambisan et al., 2019). Digital transformation can also strengthen the owner's ability to implement gradual investment by supporting better

strategic planning, risk management, and investment outcome tracking. The use of technology allows owners to break down investments into smaller stages, which can be adjusted based on initial results or market conditions (Kraus et al., 2019). In the research conducted by Corvello et al., (2023), it was shown that the characteristics possessed by MSME owners play an important role in determining digital transformation. Based on the explanation above, the hypothesis that can be developed is

H5: Managed directly by owner have a significant impact on gradual investment pattern.

The Influence of Organizations on Gradual Investment Patterns Moderated by Cognitive Response

New digital technologies such as social media, mobile data analytics, and cloud computing challenge existing business practices, and organisations can either become prominent or disappear, depending on their ability to strategise in this new competitive landscape (Volberda et al., 2021). Russell et al., (2020) conducted one of the first studies to develop a cognitive model for digital transformation; however, the authors focused on individuals' perceptions, feelings, and emotions towards digital transformation initiatives rather than on innovative behaviour. According to Solberg et al., (2020), organisations that can create favourable conditions for the transformation process will be more successful in helping their employees engage in the process and develop creative responses, which are based on the employees' cognition. The shift towards digital transformation heavily relies on the mental representations and cognitive processes of the corporate actors involved, and on the understanding of how these representations are interconnected (de Paula et al., 2023). Kozarkiewicz (2020) states that organisations have a significant influence in using digital technology to create higher value and to achieve strategic goals, and to overcome obstacles in the digital transformation process. Based on the explanation above, the hypothesis that can be developed is

H6: The impact of the organiszation on gradual investment is moderated by cognitive response, which can strengthen or weaken that relationship.

The Influence of Mechanization of IT Use on Gradual Investment Patterns Moderated by Cognitive Response

IoT technology and applications are creating fundamental changes in the way individuals and society view the workings of technology and business in the world (Vermesan & Bacquet, 2017). By exploring and understanding individual cognitive behaviour, researchers discussing the implementation of digital transformation can begin to recognise and understand the reciprocal relationship between individual cognitive

behaviour and the success of organisational change initiatives towards digital (Russell et al., 2020). Although investment in complex and expensive IT usage mechanisms in SMEs is not necessary (Petzolt et al., 2022), this situation makes it unclear for SMEs to make decisions regarding digital transformation. On one hand, they have a narrow product portfolio that does not require full utilisation of ICT investments and limited financial resources, but on the other hand, if they do not handle ICT, they cannot maintain competitiveness (Sagala & Őri, 2024). In the context of digital transformation, a study by Shahzad et al., (2022) shows that individuals' cognitive responses to technology greatly influence the success of digital transformation in organisations. Based on the explanation above, the hypothesis that can be developed is

H7: Cognitive response moderates the relationship between the mechanisation of IT use and gradual investment, strengthening at high levels and weakening at low levels.

The Influence of Simple Product on Gradual Investment Patterns Moderated by Cognitive Response

Innovation towards simpler products is the most relevant aspect of gradual investment patterns. Thus, business entities need to take strategic actions to develop business instructions, one of which is by developing new products that can be more profitable (Sagala & Őri, 2024). In creating a simple product, scientific investigation enables SMEs to make data-driven decisions and address real business problems (Dossou-Yovo & Keen, 2021), which indicates that a cognitive response is needed to make an accurate decision (Dutta et al., 2020). A cognitive response is defined as a state of perception and physiological reaction that arises from how people feel and think in response to stimuli (Bagozzi, 1986 dalam Seçilmiş et al., 2021). Therefore, cognitive responses can be considered one of the components that influence decisions (Kim et al., 2020). Thus, it can be concluded that cognitive response is an important factor in maximising the influence exerted by Simple Product on Gradual Investment Patterns. Based on the explanation above, the hypothesis that can be developed is

H8: Cognitive response moderates the relationship between Simple Product and gradual investment, strengthening at high levels and weakening at low levels.

The Influence of Organizational Structure on Gradual Investment Patterns Moderated by Cognitive Response

Organisational structure plays a crucial role in influencing gradual investment decisions, especially in dynamic business environments like SMEs. However, this impact can be influenced by cognitive response, which refers to how individuals or groups within the organisation process information, assess risks, and respond to investment opportunities. Cognitive response serves as a moderator that can strengthen or weaken the

relationship between organisational structure and gradual investment decisions. Rylander Eklund et al., (2022) argue that, due to the cognitive response tendencies in the field of management itself (de Paula et al., 2023)are unconsciously used for creative problem-solving; indeed, companies attempt to build beliefs and norms aimed at creating mental conditions and shared processes through practices and behaviours to foster empathy, collaboration, kidnapping, and iteration. An effective organisational structure supports gradual investment decision-making by providing a clear framework for resource allocation and risk management (Wang et al., 2020). However, if individuals within the organisation have a negative cognitive response, such as risk aversion or cognitive bias, the effectiveness of the organisational structure in promoting gradual investment may decrease. On the other hand, a positive cognitive response, such as openness to change and the ability to think strategically, can strengthen this relationship by encouraging better opportunity assessment and faster decision-making (Begum et al., 2022). Based on the explanation above, the hypothesis that can be developed is:

H9: Organizational structure influences staged investment, and this influence is moderated by cognitive response.

The influence of Managed Directly by The Owner on Gradual Investment Patterns moderated by Cognitive Response

Scuotto et al. (2021) state that SMEs tend to be more humane compared to large companies. This statement indicates that decision-making in SMEs is heavily influenced by their owners, who generally act as top management. Thus, leadership orientation in SMEs is crucial in determining the direction and success of digital transformation in SMEs (Sagala & Őri, 2024). In this case, a small business owner is certainly required to have cognitive responses to make accurate decisions. Greenwald (1968) proposed the cognitive response model, the role of valence thoughts in influencing attitudes. In this theory, Greenwald (1968) stated that persuasion occurs not because people study the message or source cues, but through the positive or negative thoughts they develop cognitively (Petty & Briñol, 2008 dalam Kılıç et al., 2024). Owners exhibit responsible behaviour with a positive impact (Meng et al., 2020). However, similar research has not yet been found that proves the moderating effect of cognitive response on direct management by the owner with a gradual investment pattern. Based on the explanation above, the hypothesis that can be developed is

H10: Managed directly by the owner affects incremental investment, and this effect is moderated by cognitive response.

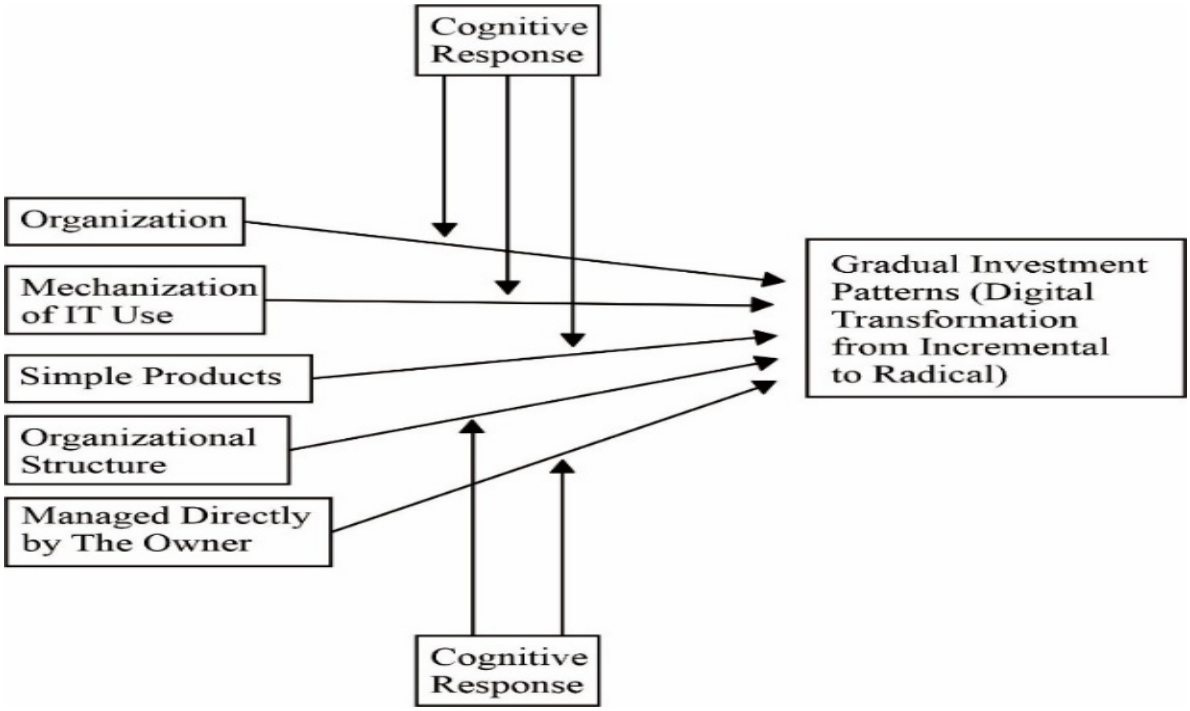

Figure. 1 Research Model

RESEARCH METHODS

Data was collected from small and medium enterprises (SMEs) in Batam City through a Google Form questionnaire. Each answer in the questionnaire uses a Likert scale with five options, ranging from "strongly disagree" (1) to "strongly agree" (5). Information related to the respondents will be kept confidential. This study also uses the purposive sampling method, where subjects are deliberately selected based on specific criteria deemed relevant by the researcher (Subhaktiyasa, 2024).

Kuesioner dibagikan kepada responden yang memenuhi kriteria dan relevan dengan penelitian. Untuk pengujian serta pengolahan data, penulis menggunakan metode Partial Least Squares (PLS). The questionnaire was distributed to respondents who met the criteria and were relevant to the research. For testing and data processing, the author uses the Partial Least Squares (PLS) method. This study uses an instrument in the form of a questionnaire that has been adjusted. The adaptation of the questionnaire was carried out from various sources, including: organizational variables, mechanization of IT use, and organizational structure referring to Rumanti et al. (2022), the Simple Product variable referring to Antunes et al. (2021), Managed Directly by the owner variable originating from Dvorský et al. (2021), the Cognitive Response variable adapted from Hanum Pertiwi & Panuntun (2023), and the Gradual Investment variable adapted from Ahmed et al. (2022).The validity and reliability testing of the data on variables and indicators were conducted using the SmartPLS and SPSS programs (Dr. Duryadi, 2021). The determination of the sample size is based on the recommendation from Gay and Diehl, who suggest a minimum of 30 respondents for correlational research. Considering this and

the characteristics of the target population consisting of SME entrepreneurs, the researcher determined a sample size of 134 respondents to ensure data quality and anticipate the possibility of unusable questionnaires.

RESULTS AND DISCUSSIONS

Results

Tablel 1. Respondent Characteristics

Variabel	***Kategori***	***Frekuensi***	***Persentase***
Gender	*Pria* / Male	36	26.9
	Wanita / Female	98	73.1
Age	< 20 Years	3	2.2
	20 - 30 Years	77	57.5
	31 - 40 Years	48	35.8
	41 - 50 Years	6	4.5
Education	Diploma	24	17.9
	Master's Degree	5	3.7
	Bachelor's Degree	69	51.5
	Senior High School	36	26.9
Position	Manager	4	3.0
	Owner	130	97.0
	Total	134	100.0

Source:

Based on the data in the table, the majority of respondents are female, totalling 98 people (73.1%), while male respondents number 36 people (26.9%). From the age group perspective, the majority of respondents are in the 20–30 year age range, totalling 77 people (57.5%), while the age group with the fewest respondents is under 20 years old, with 3 people (2.2%). Based on the highest level of education, respondents with a Bachelor's degree (S1) dominate, totalling 69 people (51.5%), while those with a Master's degree (S2) are the least represented, with 5 people (3.7%). Based on job title, the majority of respondents were business owners, totalling 130 people (97%), while respondents with the job title of manager numbered 4 people (3%).

Table 2. Average Variance Extracted (AVE)

	Average variance extracted (AVE)	**Statement**
CR	0.742	Valid
GIP	0.841	Valid

MDO	0.81	Valid
MIT	0.793	Valid
OR	0.759	Valid
OS	0.637	Valid
SP	0.795	Valid

Source:

Based on the results in the table, the Average Variance Extracted (AVE) values of each variable show figures above 0.5. This indicates that the indicators used in this study have good convergent validity, thus the data used are deemed to meet the requirements of convergent validity and are suitable for use in subsequent analyses.

Table 3. Reliability Test (Cronbach's Alpha & Composite Reliability)

	Cronbach's Alpha	**Composite Reliability (Rho_C)**	**Statement**
CR	0.913	0.935	Reliabel
GIP	0.906	0.941	Reliabel
MDO	0.922	0.944	Reliabel
MIT	0.869	0.92	Reliabel
OR	0.921	0.94	Reliabel
OS	0.905	0.925	Reliabel
SP	0.914	0.94	Reliabel

Source:

Based on the table, the results show composite reliability and Cronbach's alpha that are reliable with variable values above 0.70. This indicates the consistency and stability of the instruments used in this research. Thus, all constructs or variables in this study are good, and the statements used to measure each variable have good reliability.

Table 4. Fornell Lacker

	CR	GIP	MDO	MIT	OR	OS	SP
CR	0.862						
GIP	0.911	0.917					
MDO	0.864	0.874	0.9				
MIT	0.863	0.885	0.821	0.891			
OR	0.868	0.903	0.822	0.849	0.871		
OS	0.841	0.895	0.813	0.785	0.839	0.898	
SP	0.836	0.888	0.837	0.785	0.843	0.886	0.892

All variables show higher correlation values with their respective constructions compared to the correlation with other constructs, based on the data processing results using the SmartPLS software shown in the table. Since this shows that each indicator can greatly separate the construct it evaluates from other constructions, each has good discriminant validity.

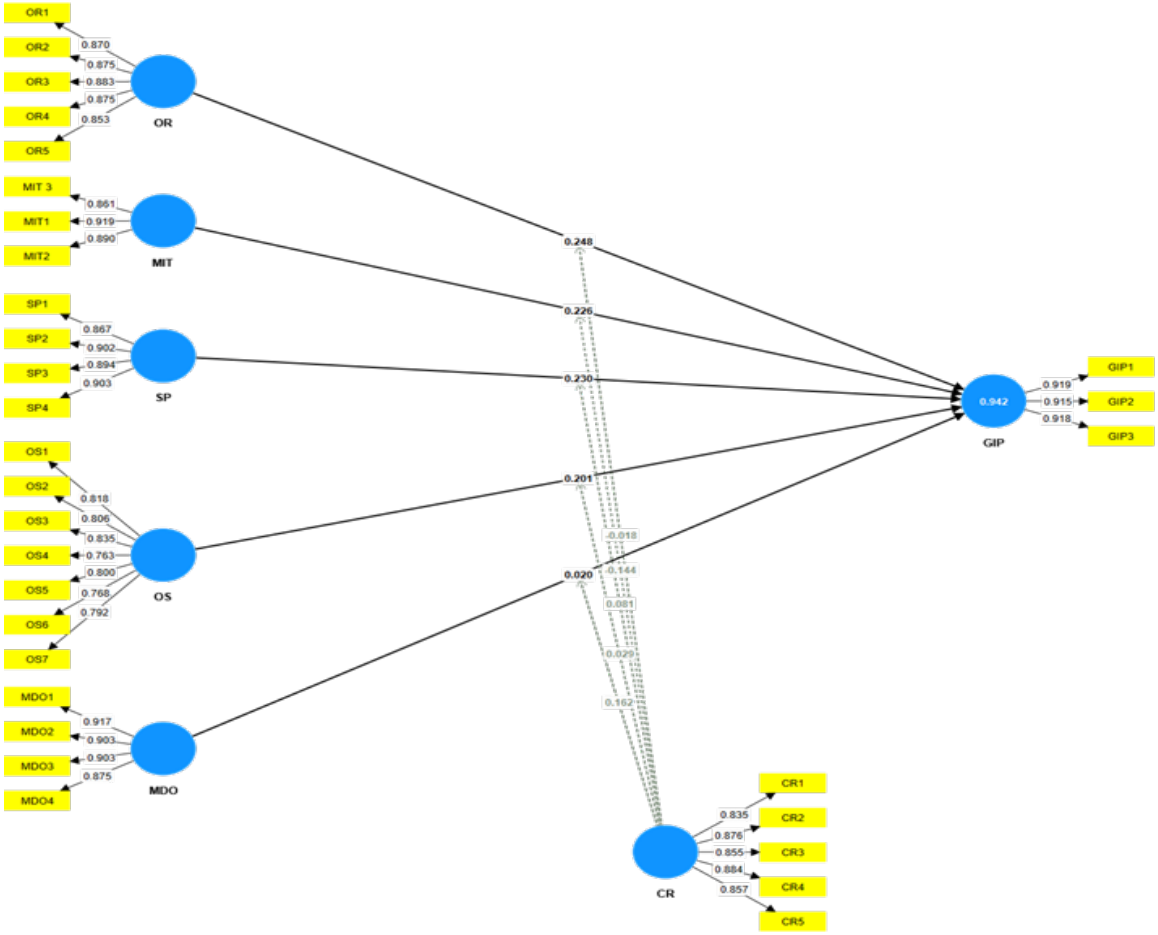

Figure 2. SEM-PLS Model

Table 5. R-Square Test

	R-square	R-square adjusted
GIP	0.942	0.937

Source:

Based on the table above, it can be seen that the R-Square value of the GIP variable is 0.942. The R-Square value of 0.942 indicates that the prediction results are in the strong category, and the variability of Y that can be explained by the variables X1 to X5 is 94.2%, while the remaining 6.8% is explained by other variables outside the scope of this study.

Table 6. Hypothesis Test Results

	T statistics	P values	Statement
CR -> GIP	2.443	0.015	Significant
MDO -> GIP	0.33	0.741	Not Significant
MIT -> GIP	3.15	0.002	Significant
OR -> GIP	3.853	0.000	Significant
OS -> GIP	3.531	0.000	Significant
SP -> GIP	3.742	0.000	Significant
CR x SP -> GIP	1.143	0.253	Not Significant
CR x MDO -> GIP	2.576	0.010	Significant
CR x OR -> GIP	0.26	0.795	Not Significant
CR x OS -> GIP	0.498	0.618	Not Significant
CR x MIT -> GIP	2.149	0.032	Significant

Source:

The analysis results show that the variables of organization, mechanization of IT use, simple products, organizational structure, and cognitive response have a significant direct impact on the phased investment pattern. Conversely, managed directly by the owner (MDO) does not have a significant impact. In terms of moderation, cognitive response has been proven to strengthen the influence of IT mechanisation and owner involvement on phased investment, but does not moderate the relationship with organization, simple products, or organizational structure.

Discussion

Based on the results of the tests that have been conducted, it is known that several factors have been proven to influence gradual investment. Organisations have a significant influence on gradual investment, a result supported by research (Mosteanu, 2020) that also shows the impact of organisations on gradual investment. The value creation process of SMEs demonstrates organisational features, which have different strategic requirements and drivers compared to larger organisations (Cosenz & Bivona, 2021). Therefore, radical innovation is considered to have the greatest impact on the performance of SMEs (Ato Sarsah et al., 2020; Garzoni et al., 2020). The IT Usage Mechanism significantly influences Incremental Investment, supported by research (Nwaiwu et al., 2020) and (Sagala & Őri, 2024). By using cutting-edge technology, SMEs can enhance their capabilities and continue to compete globally, enabling businesses to diversify and reach global markets. Additionally, it is also known that simple products influence gradual investment, where Light & Fernbach (2024) mention that a perceived simple product is conceptualised as the dimensionality of brand representation by consumers, implying that

manipulating simplicity or complexity will affect the size of dimensionality, and vice versa. This is relevant for gradual investment, as companies can assess the potential of a product through a phased approach, reducing the risk of failure due to large initial investments. Organisational structure has also been shown to influence Gradual Investment, supported by research from (Korytko et al., 2020) and (Iranmanesh et al., 2021). Regulated organisational structure and processes enhance the strength of the relationship between the application of Industry 4.0, IT implementation, and future business performance (Philbin et al., 2022).

However, there is also a factor that has not been proven to influence Gradual Investment, namely Directly Managed by the Owner. This result is supported by research conducted by (Bollweg et al., 2020). SME owners who are directly involved in managing the company also tend to have greater control over the digital transformation process (Nambisan et al., 2019), but many business owners still reject the implementation of technology because they prefer more conventional methods.
In this study, the moderating effect is provided by cognitive response, which is considered to enhance the relationship formed between each variable. From the results mentioned, it is known that Cognitive Response has proven to provide a positive moderating effect. Cognitive Response moderates the relationship between IT usage mechanisms and Incremental Investment, a result supported by research conducted by (Russell et al., 2020). Technology and IoT applications create fundamental changes in the views of individuals and society regarding how technology and business operate in the world (Vermesan & Bacquet, 2017). By exploring and understanding individual cognitive behaviour, the implementation of digital transformation can begin to recognise and comprehend the reciprocal relationship between individual cognitive behaviour and the success of organisational change initiatives towards digital (Russell et al., 2020). Additionally, Cognitive Response moderates the relationship Managed Directly by the Owner towards the Gradual Investment Pattern. Leadership orientation in SMEs is crucial in determining the direction and success of digital transformation in SMEs (Sagala & Őri, 2024). In this case, of course, a small business owner is required to have cognitive responses in order to make accurate decisions.

Some cognitive responses, including cognitive response not being able to moderate the relationship between the organization and the incremental investment pattern, did not prove to be moderate various relationships, though. These findings contradict the theory put forward by Solberg et al., (2020), which holds that companies who can create favourable conditions for the transformation process will be more successful in guiding their staff members to participate in the process and generate innovative responses grounded on their cognition. Furthermore well-known is the fact that Cognitive Response cannot control the link between Simple Products and Gradual Investment Patterns. Scientific research enables SMEs to make data-driven decisions and solve actual business challenges by means of a basic product (Dossou-Yovo & Keen, 2021). Sometimes, nevertheless, cognitive response is not particularly required as long as the data gathered

satisfies the demand for simpler product development. Furthermore well-known is the fact that cognitive reaction cannot help to control the link between basic products and the incremental investing pattern. Rylander Eklund et al., (2022) contend that occasionally innovative ideas for innovation do not surface due to the inclination of cognitive reactions in the field of management itself, thereby preventing any innovation being done.

CONCLUSION

This study shows that fundamental micro aspects such as organisation, mechanisation of information technology (IT) usage, simple products, and organisational structure significantly influence the gradual investment patterns in the digital transformation of SMEs, while direct owner involvement does not show significant influence except when moderated by cognitive response. Cognitive response has been proven to strengthen the relationship between IT mechanisation and owner involvement with investment patterns, but does not provide a significant moderating effect on organisation, simple products, and organisational structure. These results lead to the conclusion that digital transformation efforts in SMEs depend on the internal readiness of the company, which includes the structure, procedures, and strategic orientation of business actors, rather than just the adoption of technology. Therefore, MSME owners must not only improve digital literacy but also enhance cognitive capacity that enables more flexible and visionary decision-making in the face of technological changes. Owners must also restructure their organisations to be more flexible and responsive to market and technological dynamics, support the development of basic yet consumer-relevant products, and implement a planned phased investment approach to better manage risks. These approaches will not only accelerate the digital transformation process but also enhance the sustainability and competitiveness of SMEs over time.

REFERENCES

Ahmed, Z., Rasool, S., Saleem, Q., Khan, M. A., & Kanwal, S. (2022). Mediating Role of Risk Perception Between Behavioral Biases and Investor's Investment Decisions. *SAGE Open*, *12*(2). https://doi.org/10.1177/21582440221097394

Alam, K., Ali, M. A., Erdiaw-Kwasie, M. O., Murray, P. A., & Wiesner, R. (2022). Digital Transformation among SMEs: Does Gender Matter? *Sustainability (Switzerland)*, *14*(1). https://doi.org/10.3390/su14010535

Aliyah, A. H. (2022). Peran Usaha Mikro Kecil dan Menengah (UMKM) untuk Meningkatkan Kesejahteraan Masyarakat. *WELFARE Jurnal Ilmu Ekonomi*, *3*(1), 64–72. https://doi.org/10.37058/wlfr.v3i1.4719

Anggraeni, O. J., Amrulloh, M. S., Sulistyono, N. B. E., & Putra, M. E. Y. (2023).

Model Strategi Digitalisasi dalam Kemampuan Dinamis Meningkatkan Kinerja Bisnis Berkelanjutan: Bukti Empiris dari UKM Indonesia. *Journal of Business Management*, *1*(2), 33–40. https://doi.org/10.47134/jobm.v1i2.6

Anindita, F., Marbun, J., & Supriyadi, A. (2021). Pengaruh Produk Domestik Bruto, Nilai Ekspor, Dan Inflasi Terhadap Investasi Asing Langsung Di Indonesia Pada Tahun 2010-2019. *Account*, *8*(1), 1455–1462. https://doi.org/10.32722/acc.v8i1.3878

Antunes, M. G., Mucharreira, P. R., Ros, M., & Justino, T. (2021). Effects of Total Quality Management (TQM) Dimensions on Innovation — Evidence from SMEs. *Sustainability (Switzerland)*, *13*(18), 10095. https://doi.org/https://doi.org/10.3390/su131810095

Ato Sarsah, S., Tian, H., Dogbe, C. S. K., Bamfo, B. A., & Pomegbe, W. W. K. (2020). Effect of entrepreneurial orientation on radical innovation performance among manufacturing SMEs: the mediating role of absorptive capacity. *Journal of Strategy and Management*, *13*(4), 551–570. https://doi.org/10.1108/JSMA-03-2020-0053

Begum, S., Ashfaq, M., Xia, E., & Awan, U. (2022). Does green transformational leadership lead to green innovation? The role of green thinking and creative process engagement. *Business Strategy and the Environment*, *31*(1), 580–597. https://doi.org/10.1002/bse.2911

Bouncken, R., & Schmitt, F. (2022). SME Family Firms and Strategic Digital Transformation: Inverting Dualisms Related to Overconfidence and Centralization. *Journal of Small Business Strategy*, *32*(3), 1–17. https://doi.org/10.53703/001c.35278

Chatterjee, M., & Bhattacharjee, T. (2020). Ownership concentration, innovation and firm performance: empirical study in Indian technology SME context. *South Asian Journal of Business Studies*, *10*(2), 149–170. https://doi.org/10.1108/SAJBS-10-2019-0185

Chonsawat, N., & Sopadang, A. (2020). Defining smes' 4.0 readiness indicators. *Applied Sciences (Switzerland)*, *10*(24), 8998. https://doi.org/10.3390/app10248998

Corvello, V., Belas, J., Giglio, C., Iazzolino, G., & Troise, C. (2023). The impact of business owners' individual characteristics on patenting in the context of digital innovation. *Journal of Business Research*, *155*. https://doi.org/10.1016/j.jbusres.2022.113397

Cosenz, F., & Bivona, E. (2021). Fostering growth patterns of SMEs through business model innovation. A tailored dynamic business modelling approach. *Journal of Business Research*, *130*, 658–669. https://doi.org/10.1016/j.jbusres.2020.03.003

Cuandra, F., & Candy, C. (2024). Strategies and Innovations for Enhancing Sustainable Performance in SMEs During The 4.0 Digital Business Era. *Jurnal Organisasi Dan Manajemen*, *20*(1), 1–16. https://doi.org/10.33830/jom.v20i1.6449.2024

de Paula, D., Marx, C., Wolf, E., Dremel, C., Cormican, K., & Uebernickel, F. (2023). A managerial mental model to drive innovation in the context of digital transformation. *Industry and Innovation*, *30*(1), 42–66. https://doi.org/10.1080/13662716.2022.2072711

Dossou-Yovo, A., & Keen, C. (2021). SMEs and the innovation management process: A multi-level process conceptual framework. *Technology Innovation Management Review*, *11*(1), 22–33. https://doi.org/10.22215/TIMREVIEW/1414

Dr. Duryadi, M. S. (2021). Metode Penelitian Ilmiah Metode Penelitian Empiris Model Path Analysis dan Analisis Menggunakan SmartPLS. In J. T. Santoso (Ed.), *Penerbit Yayasan Prima Agus Teknik* (Vol. 7, Issue 1). Yayasan Prima Agus Teknik).

Dutta, G., Kumar, R., Sindhwani, R., & Singh, R. K. (2020). Digital transformation priorities of India's discrete manufacturing SMEs – a conceptual study in perspective of Industry 4.0. *Competitiveness Review*, *30*(3), 289–314. https://doi.org/10.1108/CR-03-2019-0031

Dvorský, J., Belás, Jr., J., Çera, G., & Bilan, S. (2021). Disparities in the Perception of Business Risks in Connection With the Achieved Education of the Owner/Manager and Doing Business. *International Journal of Entrepreneurial Knowledge*, *9*(1), 25–40. https://doi.org/10.37335/ijek.v9i1.123

Fleaca, B., Fleaca, E., & Maiduc, S. (2022). Digital Transformation and Current Challenges of Higher Education. *TEM Journal*, *11*(3), 1235–1241. https://doi.org/10.18421/TEM113-32

Garzoni, A., De Turi, I., Secundo, G., & Del Vecchio, P. (2020). Fostering digital transformation of SMEs: a four levels approach. *Management Decision*, *58*(8), 1543–1562. https://doi.org/10.1108/MD-07-2019-0939

González-Varona, J. M., López-Paredes, A., Poza, D., & Acebes, F. (2021). Building and development of an organizational competence for digital transformation in SMEs. *Journal of Industrial Engineering and Management*, *14*(1), 15–24. https://doi.org/10.3926/jiem.3279

Grooss, O. F., Presser, M., & Tambo, T. (2022). Surround yourself with your betters: Recommendations for adopting Industry 4.0 technologies in SMEs. *Digital Business*, *2*(2), 100046. https://doi.org/10.1016/j.digbus.2022.100046

Guo, L., Xu, L., Wang, J., & Li, J. (2023). Digital transformation and financing constraints of SMEs: evidence from China. *Asia-Pacific Journal of Accounting and Economics*, *31*(6), 966–986. https://doi.org/10.1080/16081625.2023.2257235

Hanum Pertiwi, A., & Panuntun, B. (2023). Pengaruh Herding Behavior, Cognitive Bias, dan Overconfidence Bias terhadap Keputusan Investasi. *Jurnal Mahasiswa Bisnis & Manajemen*, *02*(03), 112–129.

Immanuel Zai, Nasar Buntu Tan Widiana, Mualifah Nurhidayati, Sheril Fitri Riana, Jacelyn, Princessa tan Widiana, & Tan Alvin Henk Saputra. (2022). Penerapan Manajemen Rantai Pasok Berbasis Sistem ERP Dalam Meningkatkan Kinerja UMKM Rumah Makan Has Seven. *EKOMA : Jurnal Ekonomi, Manajemen, Akuntansi*, *1*(2), 223–233. https://doi.org/10.56799/ekoma.v1i2.360

Iranmanesh, M., Kumar, K. M., Foroughi, B., Mavi, R. K., & Min, N. H. (2021). The impacts of organizational structure on operational performance through innovation capability: innovative culture as moderator. *Review of Managerial Science*, *15*(7), 1885–1911. https://doi.org/10.1007/s11846-020-00407-y

Kim, M. J., Lee, C. K., & Jung, T. (2020). Exploring Consumer Behavior in Virtual Reality Tourism Using an Extended Stimulus-Organism-Response Model. *Journal of Travel Research*, *59*(1), 69–89. https://doi.org/10.1177/0047287518818915

Kılıç, İ., Seçilmiş, C., & Özdemir, C. (2024). The role of travel influencers in volunteer tourism: an application of the cognitive response theory. *Current Issues in Tourism*, *27*(2), 200–216. https://doi.org/10.1080/13683500.2023.2174087

Korytko, T., Piletska, S., Arefieva, O., Pidhora, Y., & Pryimakova, Y. (2020). Formation of Organizational and Economic Mechanism of Motivation of Increase of Investment Activity of The Enterprise. *Journal of Financial and Credit Activity Problems of Theory and Practice*, *4*(35), 418–425. https://doi.org/http://dx.doi.org/10.18371/fcaptp.v4i35.222446

Koumas, M., Dossou, P.-E., & Didier, J.-Y. (2021). Digital Transformation of Small and Medium Sized Enterprises Production Manufacturing. *Journal of Software Engineering and Applications*, *14*(12), 607–630. https://doi.org/10.4236/jsea.2021.1412036

Kozarkiewicz, A. (2020). General and Specific: The Impact of Digital Transformation on Project Processes and Management Methods. *Foundations of Management*, *12*(1), 237–248. https://doi.org/10.2478/fman-2020-0018

Kraus, S., Palmer, C., Kailer, N., Kallinger, F. L., & Spitzer, J. (2019). Digital entrepreneurship: A research agenda on new business models for the twenty-first century. *International Journal of Entrepreneurial Behaviour and Research*, *25*(2), 353–375. https://doi.org/10.1108/IJEBR-06-2018-0425

Kurnia Fitriati, T., Purwana, D., Dharmawan Buchdadi, A., & Kurniawan Subagja, I. (2020). Entrepreneurial Orientation and Sme Performance: Dynamic Capabilities As Mediation Study on Smes in Indonesia. *KnE Social Sciences*, *2020*, 74–89. https://doi.org/10.18502/kss.v4i14.7860

Li, F. (2020). Leading digital transformation: three emerging approaches for managing the transition. *International Journal of Operations and Production Management*, *40*(6), 809–817. https://doi.org/10.1108/IJOPM-04-2020-0202

Light, N., & Fernbach, P. M. (2024). Keep It Simple? Consumer Perceptions of Brand Simplicity and Risk. *Journal of Marketing Research*, *61*(6), 1152–1170. https://doi.org/10.1177/00222437241248413

Liu, Y., & Wang, M. (2022). Entrepreneurial orientation, new product development and firm performance: the moderating role of legitimacy in Chinese high-tech SMEs. *European Journal of Innovation Management*, *25*(1), 130–149. https://doi.org/10.1108/EJIM-05-2020-0204

Marín-Idárraga, D. A., & Hurtado González, J. M. (2021). Organizational structure and convergent change: explanatory factors in SMEs. *Journal of Small Business and Enterprise Development*, *28*(6), 908–926. https://doi.org/10.1108/JSBED-09-2020-0347

Meng, B., Chua, B. L., Ryu, H. B., & Han, H. (2020). Volunteer tourism (VT) traveler behavior: merging norm activation model and theory of planned behavior. *Journal of Sustainable Tourism*, *28*(12), 1947–1969.

https://doi.org/10.1080/09669582.2020.1778010

Nambisan, S., Wright, M., & Feldman, M. (2019). The digital transformation of innovation and entrepreneurship: Progress, challenges and key themes. *Research Policy*, *48*(8), 103773. https://doi.org/10.1016/j.respol.2019.03.018

Natalia, N., & Hermawan, P. (2024). Unlocking Potential: Digital Transformation and Decision Support in Automotive Repair - A Case Study. *International Journal of Entrepreneurship, Business and Creative Economy*, *4*(2), 108–122. https://doi.org/10.31098/ijebce.v4i2.2127

Norliani, Sari, M. N., Safarudin, M. S., Jaya, R., Baharuddin, & Nugraha, A. R. (2024). Transformasi Digital dan Dampaknya pada Organisasi : Tinjauan Terhadap Implementasi Teknologi Informatika. *JurnalReviewPendidikandanPengajaran*, *7*(3), 10779–10787.

Okorie, O., Russell, J., Cherrington, R., Fisher, O., & Charnley, F. (2023). Digital transformation and the circular economy: Creating a competitive advantage from the transition towards Net Zero Manufacturing. *Resources, Conservation and Recycling*, *189*. https://doi.org/10.1016/j.resconrec.2022.106756

Omrani, N., Rejeb, N., Maalaoui, A., Dabic, M., & Kraus, S. (2024). Drivers of Digital Transformation in SMEs. *IEEE Transactions on Engineering Management*, *71*, 5030–5043. https://doi.org/10.1109/TEM.2022.3215727

Osano, H. M. (2023). Global scaling by SMEs: Role of innovation and technology. *Journal of the International Council for Small Business*, *4*(3), 258–281. https://doi.org/10.1080/26437015.2023.2201896

Peter, O., Pradhan, A., & Mbohwa, C. (2023). Industry 4.0 concepts within the sub-Saharan African SME manufacturing sector. *Procedia Computer Science*, *217*, 846–855. https://doi.org/10.1016/j.procs.2022.12.281

Petzolt, S., Hölzle, K., Kullik, O., Gergeleit, W., & Radunski, A. (2022). Organisational Digital Transformation of SMEs—Development and Application of A Digital Transformation Maturity Moder for Business Model Transformation. *International Journal of Innovation Management*, *26*(3). https://doi.org/10.1142/S1363919622400175

Philbin, S., Viswanathan, R., & Telukdarie, A. (2022). Understanding how digital transformation can enable SMEs to achieve sustainable development: A systematic literature review. *Small Business International Review*, *6*(1), e473. https://doi.org/10.26784/sbir.v6i1.473

Preindl, R., Nikolopoulos, K., & Litsiou, K. (2020). Transformation strategies for the supply chain: the impact of industry 4.0 and digital transformation. *Supply Chain Forum*, *21*(1), 26–34. https://doi.org/10.1080/16258312.2020.1716633

Rasmawati, A. R., Hakim, M. P., & Sitohang, R. M. (2024). Manajemen Keuangan Pada Umkm Budidaya Jangrik Dan Dimsum Di Pondok Benda Pamulang Tangerang Selatan. *Jurnal Ekualisasi*, *5*(2), 16–26. https://doi.org/https://doi.org/10.60023/r7jnnc96

Rumanti, A. A., Rizana, A. F., Septiningrum, L., Reynaldo, R., & Isnaini, M. M. (2022).

Innovation Capability and Open Innovation for Small and Medium Enterprises (SMEs) Performance: Response in Dealing with the COVID-19 Pandemic. *Sustainability (Switzerland)*, *14*(10). https://doi.org/10.3390/su14105874

Russell, K., O'Raghallaigh, P., McAvoy, J., & Hayes, J. (2020). A cognitive model of digital transformation and IS decision making. *Journal of Decision Systems*, *29*(sup1), 45–62. https://doi.org/10.1080/12460125.2020.1848388

Rylander Eklund, A., Navarro Aguiar, U., & Amacker, A. (2022). Design thinking as sensemaking: Developing a pragmatist theory of practice to (re)introduce sensibility. *Journal of Product Innovation Management*, *39*(1), 24–43. https://doi.org/10.1111/jpim.12604

Sagala, G. H., & Őri, D. (2024). Toward SMEs digital transformation success: a systematic literature review. In *Information Systems and e-Business Management* (Issue 0123456789). Springer Berlin Heidelberg. https://doi.org/10.1007/s10257-024-00682-2

Scuotto, V., Nicotra, M., Del Giudice, M., Krueger, N., & Gregori, G. L. (2021). A microfoundational perspective on SMEs' growth in the digital transformation era. *Journal of Business Research*, *129*, 382–392. https://doi.org/10.1016/j.jbusres.2021.01.045

Seçilmiş, C., Özdemir, C., & Kılıç, İ. (2021). How travel influencers affect visit intention? The roles of cognitive response, trust, COVID-19 fear and confidence in vaccine. *Current Issues in Tourism*, *25*(17), 2789–2804. https://doi.org/10.1080/13683500.2021.1994528

Shahzad, M., Qu, Y., Rehman, S. U., & Zafar, A. U. (2022). Adoption of green innovation technology to accelerate sustainable development among manufacturing industry. *Journal of Innovation and Knowledge*, *7*(4), 100231. https://doi.org/10.1016/j.jik.2022.100231

Šimberová, I., Korauš, A., Schüller, D., Smolíkova, L., Straková, J., & Váchal, J. (2022). Threats and Opportunities in Digital Transformation in SMEs from the Perspective of Sustainability: A Case Study in the Czech Republic. *Sustainability (Switzerland)*, *14*(6). https://doi.org/10.3390/su14063628

Sipa, M., Gorzeń-Mitka, I., & Skibiński, A. (2015). Determinants of Competitiveness of Small Enterprises: Polish Perspective. *Procedia Economics and Finance*, *27*(15), 445–453. https://doi.org/10.1016/s2212-5671(15)01019-9

Solberg, E., Traavik, L. E. M., & Wong, S. I. (2020). Digital Mindsets: Recognizing and Leveraging Individual Beliefs for Digital Transformation. *California Management Review*, *62*(4), 105–124. https://doi.org/10.1177/0008125620931839

Straková, J., Talíř, M., & Váchal, J. (2022). Opportunities and Threats of Digital Transformation of Business Models in Smes. *Economics and Sociology*, *15*(3), 159–171. https://doi.org/10.14254/2071-789X.2022/15-3/9

Subhaktiyasa, P. G. (2024). Menentukan Populasi dan Sampel : Pendekatan Metodologi Penelitian Kuantitatif dan Kualitatif. *Jurnal Ilmiah Profesi Pendidikan*, *9*(2620–8326), 2721–2731. https://doi.org/https://doi.org/10.29303/jipp.v9i4.2657

Teng, X., Wu, Z., & Yang, F. (2022). Research on the Relationship between Digital Transformation and Performance of SMEs. *Sustainability*, *14*(10), 6012. https://doi.org/10.3390/su14106012

Vermesan, O., & Bacquet, J. (2017). *Cognitive Hyperconnected Digital Transformation* (1st Editio). River Publishers. https://doi.org/10.13052/rp-9788793609105

Volberda, H. W., Khanagha, S., Baden-Fuller, C., Mihalache, O. R., & Birkinshaw, J. (2021). Strategizing in a digital world: Overcoming cognitive barriers, reconfiguring routines and introducing new organizational forms. *Long Range Planning*, *54*(5), 102110. https://doi.org/10.1016/j.lrp.2021.102110

Wang, H., Feng, J., Zhang, H., & Li, X. (2020). The effect of digital transformation strategy on performance: The moderating role of cognitive conflict. *International Journal of Conflict Management*, *31*(3), 441–462. https://doi.org/10.1108/IJCMA-09-2019-0166

Yulfiswandi, Zakhariah, C., Winny, L., & Chandra, T. (2022). Pengembangan Strategi Perencanaan Keuangan dalam Penanganan Investasi Bodong di Indonesia. *Jurnal Mirai Manajemen*, *7*(1), 173–184. https://doi.org/10.37531/mirai.v7i1.1759

Yuwono, W., Fitriyanti, S. D., & Nainggolan, F. (2025). The Impact of Digital Marketing Innovation and Strategic Orientation on Firm Performance: Mediation by Marketing Capability and Moderation by Risk Management. *Revista de Metodos Cuantitativos Para La Economia y La Empresa*, *39*, 1–19. https://doi.org/10.46661/rev.metodoscuant.econ.empresa.10841

Zhang, J., Long, J., & von Schaewen, A. M. E. (2021). How does digital transformation improve organizational resilience?—findings from pls-sem and fsqca. *Sustainability (Switzerland)*, *13*(20), 11487. https://doi.org/10.3390/su132011487

Ziółkowska, M. J. (2021). Digital transformation and marketing activities in small and medium-sized enterprises. *Sustainability (Switzerland)*, *13*(5), 2512. https://doi.org/10.3390/su13052512