

Innovation And Technology in Management, A Pathways to Sustainable Growth for MSMEs In Indonesia

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Abstract

MSMEs sector is one of the engines of Indonesia's economy through its enormous contributions in GDP and absorptions of workforce. Yet, their competitive capacity and sustainability are hindered by low investment lacking in human capital, a low level of digital literacy, and a penchant of reluctance to change. In the era of technology, business transformation levers of innovation and technology are considered essential, their coverage across the MSME management are low. The purpose of this study is to examine the technology absorption and implementation in the managerial system and the consequences of such implementation in terms of performance and resiliency of the Indonesian MSMEs. A qualitative multiple case study was undertaken and the data obtained from semi-structured interviews, observation and document analysis in MSMEs across various sectors. Thematically analysis with inferences grounded in grounded theory identified six major themes namely, (1) motivation for adoption through relative advantage, and opening of market opportunities, (2) continued barriers such as financial resources and cultural restrictions, (3) leadership response and management innovation, (4) employee commitment, digital skill formation (5) customer reliance influenced by digital capability, and (6) sustainability and competitive re-alignment. Our findings are a synthesis of the Resource-Based and Knowledge-Based Views, as well as the Dynamic Capabilities, and Diffusion of Innovation, and Technology Organization Environment, and Socio-Technical Systems literature. The results demonstrate that successful implementation of DT in MSMEs is not merely technological; it also concerns with adaptive leadership, organization readiness and social and cultural fit too.

Keywords : *innovation, technology, MSMEs.*

JEL Codes : O32, Q01, L26

INTRODUCTION

Businesses exist in a climate of constant change they are driven to change, they hunt for new sources of innovation and they struggle to survive. And we also face global forces changing consumer habits, new competition – therefore the old levers that we pulled, the the thinking that got us to this place is not going to get us to the next level in the digital age. The New Rules of Business The new rules are changing everything we think about work everything we lead everything we code culture everyone we deem a leader and the way we engage with customers. Management used to be very hierarchical, procedural but gets disrupt by digital and data led decision making. Tech has intentionally moved beyond management-as-efficient, and is a strategic tool in helping organizations scale. Consider here the more sophisticated analytics and big data that enables a manager to forecast demand, to make sure that supply chains are optimised and to provide a customer with experiences they like. We have an abundance of productive efficiency-adding technology, namely automation, (see also RPA) that we shouldn't need to do repetitive operator-churning work and we should be focused on creative, strategical work - work that we can feel good about in terms of how we contribute to our employer to our customer to society. Machine learning driven by data in real-time leads to faster decisions, this allows organizations to derive insights that were not possible with other traditional forms of analytics. And in that way, technology is more crutch, technology is transforming what it means to manage, to something that's much less fixed, but much more creative and responsive.

And guiding innovation is nothing new and not only about new technology all at once. It also entails rethinking corporate culture, models of leadership and the way employees are collaborating and contributing. The move towards open innovation, agile business models and interdisciplinary teams is

just one instance of management practice playing catch-up with technology. For the harder thing here is for leaders to resist the wave of pressure to make everything technological and digitized, and instead lead as humanity continues to try and find its place in the world: not so much to ‘stop the digital change’ as to ensure that the digital change does not advance, overpower, the human face of organizational life. On the other hand there is plenty of literature on the DT, but there is a void, and that is what the relation between the innovation and the technology in this case from the management point of view. The main trend of research has actually been directed to the use of technology or to operational impacts, paying very little attention to the impact of these tools on the classical management function (planning, organizing, leading and controlling). Similarly, there is now only gradually accumulating proof about how managers across a variety of settings such as in MSME’s, multinationals, and in the public sector bodies are transforming the innovation of technology into competitive advantage. With this in mind, the work is a contribution to a v/hile to ""map" the changing constellation between innovation, technology and business. Its focus is to understand the anatomy of how firms create technology in fabric for their operating processes, how managers create technology to close the loop between innovation and business and what actually emerges in organizational agility, efficiency and performance writ large. Results are expected to have theoretical implications in the fields of management and innovation studies, as well as managerial implications to firms in the age of disruptive digital transformation.

Micro, small and medium-sized enterprises (MSMEs) have become a key sector of the Indonesian economy. They contribute over 99% of total businesses, occupy more than 97% of the workforce and contribute to approximately 60% of the country’s GDP. More than their economic function, MSMEs are also rooted in the social and cultural life of Indonesia, which support millions of people working in the community and in the town or rural area (Indonesia, 2022). However, despite their significance, a number of MSMEs still encounter various chronic problems such as: i) competitiveness; ii) productivity, and iii) the sustainability (Devita, 2024). The rapid advancement of innovation and technology is restructuring the way businesses are conducted across the globe, and MSMEs in Indonesia are no exception to this rule. E-commerce platforms, social media marketing, cloud-based business solutions, and fintech apps, among other digital technology innovations, have unlocked new opportunities for growth, efficiency, and reach into new markets. For instance, digital payment systems and internet marketplaces have allowed small Indonesian enterprises to access wider markets, lower transaction costs and build stronger links with clients. Likewise, the implementation of customer relationship management, data analytics, and the use of digital communication platforms have helped some MSMEs’ professionalize their work, in addition to improving their decision-making capacity.

But incorporation of innovation and technology for management system in MSME is uneven. There are many small business owners who are digital or innovative lagment but they can still use old school types offullying or management. Barriers like digital illiteracy, the access to and use of digital resources, financial constraints, infrastructure development, as well as cultural resistance remain standing in the way for the expansion of usage. Thus as for an MSMEs surplus proposition that is innovation-based, there are others fighting substitution in the digital age under pressure of globalism. Theoretically, innovation and technology can be viewed as strategic assets which enhance competencies of MSME to identify opportunities, exploit them appropriately and reconfigure operations in the face of changing environment. However, there has been limited empirical research into the way Indonesian MSMEs have been adopting innovation and technology in their business operations. The literature generally describes digital transformation and does not focus enough on how to use new digital tools practically in relation to what managers do in a day: plan, organize, lead, control. These gaps is attempted to be filled in the present research by how they introduce the innovation (and technology) in their management and what are the encouraging or obstructing factors as well as the resultant implication brought by the innovation in the form of dimension of competitiveness, resilience, and sustainability. Through an analysis of the dynamics between management system regime, technology adoption/weeding out and innovation activities, the research output contributes to further understanding how small firms can more effectively make digital transformation the method to survive – and even to prosper – in the digital age. Lastly, the outcomes are expected to potentially contribute for stake holders such as policy makers, businesspeople associations, and MSME field players in the making of strategies, policies and interventions in support of inclusive and sustainable development of MSME in Indonesia.

LITERATURE REVIEW

This study draws upon several theoretical lenses to explain how innovation and technology influence management practices and performance outcomes among MSMEs in Indonesia.

Resource Based View and Knowledge Based

RBV offers one of the most extended perspectives on the ways of how organizations gain and sustain competitive advantage. The main aspect of the theory is an implication that firms are not merely bundles of activity or of financial capital but instead they have bundled together tangible and intangible assets that may vary across firm and are not easily reproducible by competitors (Abdurrahman, 2025). The essential constituents of the firm-specific capability are valuable, rare, inimitable and nonsubstitutable (VRIN) resources. In the case of MSME in Indonesia, the technological aspect that is integration of technology, both digital platform and data analytics, to fintech solution, is similar to a strategic resource that, used appropriately can lead to a structural change of how the organization of interest currently operate their business and compete. Technical resources are more prone to a network effect (or scaling), and, when invested in and adjusted to the management process, further enhanced by the entrepreneurial creative act, which, again, has low marginal costs of multiplication (when such things are successful). As an example, when an MSME registers with an ecommerce platform, not only does it increase the reach of customers, but it also obtains valuable data-driven intelligence that can be used to make decisions, improve customer relations and simplify logistic chains optimisation. The Knowledge-Based View (KBV) is another construction and an elaboration on the linkage between resources and competitive advantage, but more specifically on the role of knowledge as the most strategically valuable resource that a company could possess, as it is based on the RBV (Wu et al, 2025). Such knowledge is not confined to formal data and systems of information but encompasses the un-codified body of know-how, experiences and talents that lie within managers and employees. It is there, where knowledge emerges as the most important distinguishing factor among the MSMEs that are very lean in terms of money and manpower. The extent to which business owners understand the digital tools, analyze the market signals and change to respond to technological trends will be the difference between interesting technology and technology used in a superficial way and technology used in a transformative way. In this sense, digital literacy does not only denote the Pkaa ownership and utilisation of technology tools, but the capacity of entrepreneurs to re-assemble them through new business models or marketing approaches, and to be innovative beyond productive efficiency. (Vigfússon et al., 2025).

The RBV and KBV are therefore interwoven in explaining the relevance of innovation and technology on the management of MSME. Resource potential of technology is immense, yet the ability of the firm to utilize its knowledge that defines how useful it is. Without an organised managerial understanding, digital platforms could be not used effectively or abused, reducing their role in competitive advantage. Conversely, simple (even) technology can be innovatively propelled toward improving business performance on the occasion of a robust managerial knowledge. This dynamic of resources and knowledge is of special significance to MSMEs in Indonesia, which are faced with diverse challenges due to their financial limitations, infrastructure and a resistance to change as a cultural phenomenon (Monson, 2024). That being the case, it is not probable that the successful companies would be the ones possessing the most sophisticated technology, but those that can adjust the existing tools to the managerial knowledge and flexible strategies. It is against this backdrop that RBV can be used to suggest considering technology as a strategic resource and KBV can explain how the resources ought to be implemented differently, basing it on the learning power, creativity and digital skills of the managers of the MSME and its teams. (Liu et al., 2025).

Dynamic Capabilities Theory

The fact that resource availability matters does not mean that the strategic value of resources resides in the mere possession of the resources, but the ability of the organization to transform, renew and re-combine the resources on a continuous basis based on the changing environment. It is what the Dynamic Capabilities Theory sharply focuses on and moves beyond the fixed point of the Resource-based View to focus on processes that enable organizations to compete in volatile, uncertain, complex and ambiguous environments (Zhou and Wei, 2025). Dynamic capability can be defined as the ability of an organization to perceive change within the market environment, exploit opportunities and re-arrange itself as it adjusts to transformations in the market. In other words, the fodation of a potential advantage lies in resources, but the active capability to organize, transform, and reconfigure those resources is what enables organizations to endure and thrive in the face of a rapidly evolving technology and/or market disorder. In

the case of the Indonesian MSMEs, dynamic capabilities assume a highly practical and yet strategic role. A nose to the digital space is to always be sniffing the digital space to see any indications of change (i.e., new e-commerce plays, shift in how consumers prefer to pay products (i.e. without cash) or the growing influence of social in creating brand). This perception encompasses not only the insight regarding the technological trends, but also interpretative ability to understand which of the innovations would be appropriate to the particular scale, sector or particular clientele of the MSE development. In an example, a small food stand in Kediri will experience the wave of the application-based delivery service which has become more and more popular; and a handicraft manufacturer in Yogyakarta will understand the potential of becoming global of a cross-border online shopping site. (Gupta, 2021).

Due to the identification of the opportunities, the exploitation capability is also critical. The process of catching is the ability of the owners and managers of MSMEs to make strategic decisions according to the investment of proper technologies, mobilization of financial and human resources, and integration of the decisions into the practical implementation. In practice this may very well be in the form of customer relationship management (CRM) software, or indeed more efficient management and customization of interaction with customers, the implementation of fintech software to streamline and accelerate transactions and control of cash flow, or it may simply mean the use of digital advertising platforms to reach a larger number of customers at a more affordable price. Nevertheless, to capture is not merely to acquire technologies, move them off the shelf to the kitchen, and implement them to the cooking and integrating such tools into business models, adapting them to the expectations of customers and long-term customer-focused strategic benefits (Shastitko and Golovanova, 2016). Seize-and-succeed is often a question of management vision, risk-taking spirit and the ability to focus meag resources on the areas of greatest impact. The third dimension, change capacity is central to the development of the competitive advantage sustainability of MSMEs, based on short-term opportunities. Reconfiguring involves redesigning current processes, re-specification of leadership functions and even altering the organisational culture to motivate employees to work with and not simply add-on technology. Indicatively, an MSME may be required to reorganize inventory control, educate staff to handle electronic orders, or reorganize marketing approaches to e-commerce, Internet consumer behavior, etc. in order to introduce e-commerce. Similarly, the decision to incorporate digital finance may necessitate changes in the accountancy procedure, the functions of staff, and the routine of compliance. The re-engineering usually involves readiness to drop current habits, form new practices and institutions and willingness to learn to cope with the nature of change that is difficult (but not impossible) to the resource-constrained MSMEs, but is critical in a constantly changing business environment. Therefore, dynamic capabilities is not just an idea, but a living process to determine the response of Indonesian MSMEs to challenges of globalization, technological disruption and consumer demands. This is due to the fact that the process of sensing, seizing and reconfiguring implies that the adoption of technology is not a facade or one-off activity, but rather, it is a subset of the greater narrative of strategic management. When MSMEs effectively build these capabilities, they can not only be better positioned to withstand exogenous shocks, but capture new opportunities and be more resilient in the digital economy, leading to growth. That is, resources are raw materials of competition and dynamic capabilities being the engine that alters that material into performance that is adaptive, innovative and persevering.

Diffusion of Innovation Theory

The Diffusion of Innovation (DoI) Theory offers a fruitful perspective for understanding how new technologies and practices are diffused amongst organisations and communities. DoI suggests that adoption is not one decision, but a social and temporal process defined by communication, perception, and interaction among individuals, organizations, and their broader networks. Fundamentally, the theory posits that the probability of adoption will be determined by the users' perceptions of specific attributes of the innovation (Enkel & Wintgens, 2025). Concerning the factors used to determine the acceptance of technology, these five characteristics are known by the acronym of RCACT in Portuguese relative advantage, compatibility, complexity, trialability, and observability and, become determinants of the disposition of MSME owners and managers, to adopt technological solutions. Relative advantage is very important to Indonesian MSMEs. This characteristic is the extent to which an innovation is perceived as better than the idea it supersedes. For instance, it may be considered that digital payment systems are more efficient and secure than the traditional text-based cash transactions and that social media marketing is more cost-effective and wider-reaching than traditional form of advertisement. If MSME proprietors think a given technology brings them clearly significant efficiency gains, cost savings, expanding

customer base or competitive edge, they adopt it more readily. But, when the pros are unclear or difficult to quantify, most business professionals shy away, concerned of throwing away money or security for a possible benefit. (Abdalla et al., 2024).

Another important dimension is compatibility, which denotes to what extent an innovation is compatible with current values, habits, and requirements. Indonesian MSMEs are fragmented, including traditional craft producers and modern services, and their openness to the use of technology is contingent on whether or not new tools fit their existing work routines and social norms. A mom-and-pop-style food vendor in the countryside might, for example, be loath to utilize online ordering channels if they challenge traditions of in-person transactions and local reputations. On the other hand, businesses which already have a respect for digital engagement or experience with online platforms will be better placed to incorporate new innovations. Compatibility therefore influences to an extent the amount of time required to implement and integrate technology into the organization.(Ayanwale & Ndlovu, 2024).

The complexity, which is a feature that defines the perceived relative difficulty of an innovation to comprehend or use is especially relevant in the Indonesian MSME sector, the digital literacy of which is highly heterogeneous. Many owners of the MSME particularly those residing in the rural or less resourceful areas might also find it to be threatening, too technical or complex. The challenge may also be the low rates of digital literacy even in the presence of tools and therefore they may underutilise or fail to utilise or misuse the digital tools hence the tools may not achieve the benefits they might have after adoption. This complexity is the root cause of psychological and practical obstacles, and this explains the need to train, mentor, and provide easy user interfaces to ensure that MSME adoptees can transcend the initial resistance. MSME predictors of innovation adoption is also trialability whereby when they have the possibility, of experimenting limitedly and testing it, then they will adopt innovation. SME-owners are ready to be able to test new technology provided that they can afford it without excessive expenditure or without the necessity to change their business model. The freemium software structure, pilot projects under government funding, and a small subsidy on digital platforms can provide MSMEs with an opportunity to explore new tools in not so risky scenarios. Such hands-on experience with the technology not only helps to slice through the fog, but also provides business owners with the confidence to experience a tangible consequence of a full-fledged investment.

And finally, observability, or the extent of the observability of the impacts of an innovation, facilitates peer influence and emulation. In many cases, MSMEs are not operating in isolated business environments but are instead found within restricted business ecosystems, whereby the entrepreneur acquires behaviour through emulating the conduct of others, competitors and local leaders. The MSMEs will be more likely to also get it done when they can see neighbouring business enjoying the benefits of digital marketing, e-commerce and fintech. Diffusion may be accelerated through such social validation by reducing the degree of perceived risk and legitimizing the innovation. Nevertheless, through these channels, a majority of Indonesian MSMEs continue to experience adoption obstacles, including low digital literacy, inadequate financial resources, inadequate infrastructure and aversion to change (Acikgoz et al., 2023). These drawbacks also contribute to the perceived weight of complexity and compatibility of decision making and thereby it obstructs the relative advantage that could have otherwise been realized (Rogers 2003). The implication of this is that effective strategies to facilitate the uptake of innovation must consider not only the technology, but also the social, educational and cultural/work organization settings of MSMEs within which they are now housed. To sum up, the Diffusion of Innovation Theory underlines one more thing: adoption is not simply about the presence of a certain technology, but its perception and its social validation within the particular setting of MSMEs. Using the theory of relative advantage, compatibility, complexities, trialability, and observability to the Indonesian context it can be demonstrated that technology adoption in Indonesia is a complicated affair that there is a massive potential in terms of growth of MSMEs, but there is also massive structural barriers that need to be surmounted in order to see MSMEs succeed beyond the digital era.

Technology Organization Environment Framework

The TOE framework however, provides us with a comprehensive look at the issues that affect technology adoption by arguing that it is not a matter of individual choice but of the systemic conditions that occur in the larger ecosystem (Alnoor et al., 2025). The reason why some companies succeed in the implementation of an innovation and others fail can be explained by three factors that are technological, organizational, and environmental in nature (TOE framework). This model is particularly applicable in

the case of Indonesian MSMEs because it takes into account the complexity of both intra and intercompany forces which affect managerial innovativeness and technology application in the company activity. The level of technology is associated with the availability, accessibility and the nature of technologies that can be availed to an organization. To MSMEs in the country, these are mobile payment, e-commerce, customer relationship management, data analytics and cloud-based business app. The ease with which a technology could be used, its affordability, and integration with the already implemented system are all directly connected with adoption. As an example, despite the presence of advanced corporate software, which is being sold, it is very costly, and licenses very costly, particularly to the large numbers of MSMEs currently expanding, and low-cost mobile apps tailored to micro, small and medium-scale businesses are convincing and viable. The willingness to use and utilize these technologies, which are directly and indirectly reflected in the attitude of MSME owners to the usefulness and simplicity of their application, is also the determinant of the degree to which the latter view these technologies as a necessity or non-necessity purchase (Zeng et al., 2023).

The organizational factor entails the internal conditions of the organization that either aids or obstructs the uptake of a technology. The most important ones include e-leadership, resources, culture and skills of employees. To many MSMEs the ownership-based leadership plays central role, and the vision and progressive thinking of the owner-manager determine the acceptance of the need to change. The resources are also a consideration since the use of technology may require initial investment which is not easily purchased by smaller businesses. Diffusion may be supported or disrupted by organisational culture, which is either risk-adverse or favouring change. Another factor, which, however, is no less significant, is the level of digital education in workers and leadership: in the absence of knowledge, the most successful technologies will go to waste. In the Indonesian MSME sector, especially, where the majority of the enterprises are family businesses and employ a limited number of workers, establishing organizational preparedness is a difficult process that should be launched to achieve a successful digital transformation.

The environmental dimension focuses on the influence of external environment in which MSMEs are integrated. Some of the variables that fall within this spectrum are competition pressures, customer needs and requirements, characteristics of the industry, government laws and the supportive infrastructure. As an example, in the era of intense competition, the MSMEs in the local markets have had to resort to digital marketing as a means to keep up with the competition, in the normative driven society where consumers favor digital payment systems, has become compulsory that the entrepreneurs modernize the process that their business operates. It is also important to be driven by government initiatives (as well as it may be training initiatives, financial incentives, or digital literacy campaigns). However, irregularities in infrastructure such as poor internet penetration in rural areas can speak in favor of the MSMEs in rural belts. Similarly, when it comes to the small companies that lack the resource to sift through such requirements and regulations as easily as possible, the need to comply with the requirements and regulations pertaining to digital finance or e-commerce can be just as complex.

These three dimensions actually do not operate in vacuum but combine to have an impact on the magnitude and success of technological infusion. An example is that the technological factor in itself may not translate into technology adoption when other factors may have played in like the absence of commitment by the management of the organization (organizational factor) or employees lack skills to use the technology (individual factor)⁷². Similarly, high degree of organizational readiness may not translate to early adoption where the external environment undermines the business case (environmental factor) by under-delivering infrastructure or by customer lack of demand e.g. The TOE framework, consequently, points out that fit is demanded in three dimensions, namely, technologies, organizations, and environments (Tornatzky and Fleischer, 1990). In the case of the Indonesian MSMEs, the implementation of the TOE framework implied that the process of digital transformation of these MSMEs is non-linear because it is exposed to systemic interaction between the internal and external dynamics. This has the implication that, MSME innovation leading policies and strategies must be not just technology availability-oriented; but a preoccupation with the construction of technological capability, and facilitative environment via infrastructural assistance, regulation and cross sectoral collaboration within the ecosystem. In this broad sense of adoption, the TOE model provides a potent conceptual framework through which the opportunities and the challenges that MSMEs face when incorporating innovation and technology into their managerial processes will be understood.

Socio Technical Systems Theory

Socio-Technical Systems (STS) approach provides the needed balance against a technological tools and infrastructures-focused view of digital transformation. STS which has roots in organization theory and industrial sociology asserts that every organization is typified by two complementary subsystems: the technical system which comprises of technologies, tasks, and structures and the social one which entails individuals, culture and relationships. These subsystems must be co-optimized to ensure that transformation will be successful and long term (Benchis et al., 2025). A technological orientation that fails to consider the human factor will tend to produce resistance, inefficiency or undesirable side effects, but a holistic so brew formation of, and through, human and machine actors will (How and estrich 2003). This perception highlights the fact that digital transformation is not merely a process associated with e-commerce platform, fintech tool or data analytic adoption alone in the Indonesian MSMEs context. The changes in leadership behaviours, the changes in the roles of employees, the change in the interaction with customers, etc., must accompany an innovation in order to make it deeply embedded in management practice. The flexibility of leadership also matters a lot: numerous MSMEs are headed by owner-managers, and the acceptance of digital initiatives will depend on the vision of the owner-managers of the change and their readiness to change the working model. Leaders will be forced to move away command and control to participatory styles that allow experimental, learning and trust in digital forms of working. This is the demand of adaptable leadership because the most effective tools will be useless when they are not used by staff.

Employee engagement is also the so-called theme of the social-technical balance. When your employees feel out of place, unprepared or fearful of the digital transformation, the resistance will make adoption one-dimensional or more of form. However, when the employees are provided with an opportunity to acquire new digital skills, share their ideas to make the process more innovative, and be able to see the actual benefits of their work, then they will become a co-creator of the transformational process. In the case of MSMEs that operate on a small team, the given aspect is even more significant since every member of the team will have a disproportionate influence on the everyday functioning and relations with the clients. On the same note, customer trust exemplifies the customer social system as the external system that MSMEs ought to nurture. Personal touch, convenient and originality when it comes to the treatment of small businesses is still sought by many Indonesian customers. Adoption of digital with these trust relationships broken in some cases such as through elimination of the personal service aspect or through abuse of the data, can diminish and not increase loyalty. Therefore, MSMEs must take advantage of technologies that do not erode trust but rather establish transparency, responsiveness and personalisation in the manner in which small firms attend to the customers. (Sony & Naik, 2020).

Finally, the socio technical systems perspective instructs the view that technology is neither a force nor a pure power, but rather the power of technology is fully dependent on the practices of sociality, the organizational cultures and the stakeholder relations, in which it gets inscribed. In the case of MSMEs, it implies that success does not reside in implementing the most modern and impressive technologies, but in the appropriate sociotechnical fit, i.e., the synergies of digital tools with the humancentered management practices, taking into consideration their local values and cultural endowments, and relational processes. When the different sectors are unified on the technical and the social aspect, then the MSMEs are able to ensure that the innovation does not cause alienation and disruption but resilience, inclusiveness and sustainable development. (Gazos et al., 2025).

RESEARCH METHOD

This research used Qualitative Analysis. Qualitative Method This type of research can be placed within the interpretivist epistemological perspective, since the interpretivist paradigm is based on the assumption that reality is constructed and is best looked through the meanings, experiences and points of view of people (Creswell, 2013). Contrary to the emphasis upon measurement, hypothesis testing and generalizability in quantitative methods, qualitative investigation focuses on depth of understanding of a phenomenon in its natural setting. It does not aim to simply put complex emotions into a neat number, rather it aims to reflect this richness, varying cultures and subjective aspects of human and institutional behaviour (Broom & Broom, 2024). The potential of this methodology for the study of innovation and technology adoption of MSMEs lies in the fact that such is deeply rooted in cultural values, managerial practices and context. The failure or success of technology adoption and implementation cannot have a conclusion merely by taking into consideration adoption statistics or KPI figures but also how

entrepreneurs understand digital tools, how staff react towards change within their organization, and how clients comprehend changes in service delivery is very important. Such subjective and sociality-mediated dynamics render the recourse to qualitative inquiry not only relevant but indispensable. The qualitative method most appropriate for this study is the multiple case study. A case study, therefore, enables researchers to do a detailed investigation of ‘real-life’ phenomena within a bounded system (in this case MSMEs) and to answer ‘how’ and ‘why’ questions about contemporary events; in this particular case in a complex context. The option of a multiple case study, instead of a single, allows identifying both patterns and divergences within diverse MSMEs (industry, size, ownership structure, geographic location). This frame enhances the validity of results by providing comparison between cases across the same frame while in the same time by retaining the depth of description within each case. The method is in line with constructivist grounded theory that highlights the inductive theory development from detailed qualitative information. Though the main design is case study, the analysis is expected to draw upon grounded theory techniques such as open coding, axial coding, and constant comparison in order to develop conceptual categories and theoretical insights to explain the process by which innovation and technology is absorbed into MSME management.

The research will take place in MSMEs throughout various sectors (e.g., culinary, handicrafts, services, retail) in Indonesia. A purposive sampling will allow the selection of cases which can demonstrate differences in the degree of digital adoption, from MSMEs that have been able to integrate innovation into its management practices, to those that are limited by barriers and resistances. The incorporation of negative cases will enable a more complete understanding of enablers and barriers. In each MSME there will be owner-managers, employees and where feasible customers, in order to develop a range of views on innovation and technology adoption. The sample size will be determined by theoretical saturation and because there are typically 4–6 MSME cases with multiple informants in each. The methods used included semi-structured interviews, participant observation, and secondary data review. Interviews touch upon managers’ field vita, technology perceptions, innovative practices, challenges and views of organizational change. Observing the everyday, routines, technology use, or customer communication will orient interview themes, as will documents such as business reports, digital marketing copy, or government training materials.

Sample interview questions include:

- 1) “Can you describe how your business started using digital tools, and what motivated that decision?”
- 2) “What challenges did you face when trying to adopt new technologies?”
- 3) “How has the use of innovation and technology changed the way you manage your employees or interact with customers?”
- 4) “What does digital transformation mean to you as a small business owner?”

Data analysis The analysis of the data will be conducted through thematic analysis (Hole, 2024) motivated by the methods of a grounded theory. Transcripts and field notes will be coded in a systematic way to discern similarities and emerging themes. Inductive generation of first codes will be followed and the codes will be listed under descriptive categories (e.g., drivers of adoption, barriers to change, reconfiguring staff, management, Trust of customers in digital processes). Besides, axial coding will be applied to establish interrelationships between the categories whereas selective coding will merge these into an innovation and technology integration theory in MSMEs. NVivo (version 10, QSR) will be used in organizing and analyzing the data. In order to achieve rigour, research credibility will be determined based on criteria of trustworthiness of the data: credibility (through triangulation to cross-validate data of interviews, observations and documents), transferability (by giving thick description of the cases), dependability (through audit trail of analytic decisions), and confirmability (through reflexive research and peer debriefings). The study will be conducted with the ethical approval. These will include an explanation of the study, bevoluntary nature of the study, and the right of the participants to withdraw any time. Name and other sensitive information will be anonymised to assure confidentiality. In businesses, interviews and shadowing will be recorded with the consent of the participants having been received. The research is planned to be conducted in the form of multiple studies through qualitative research methods in order to comprehend how Indonesian MSMEs integrate innovation and technology in the management of the company. The article uses the interpretivist lens and the tenets of the grounded

theory to explore the depth, contextual colour, and theory generation that arises on the basis of those parties who act entrepreneurship and their co-actors.

RESULTS AND DISCUSSION

Drivers of Technological Adoption

The similarity in interviews is that MSMEs were willing to adopt ICTs in the case when they could realize the benefits in terms of competitive positioning in the market, the organization of business processes, and customer demands. Many entrepreneurs emphasized that platforms enabled them to overcome geography, access new customer segments, and transact more easily, more safely and transparently than cash. e-commerce platforms enabled small businesses in Yogyakarta and in Kediri reach new customer segments and transact more easily, more safely and transparently than cash. The spirit of the times catch up was high and some of the MSME owners expressed that it was not only a question of gaining an advantage, but also not being left alone in a market that is increasingly becoming competitive.

Interview Excerpt:

“Before we joined the online marketplace, we only sold to local buyers. Now, 60% of our customers come from outside the city. It saves us time and expands our reach beyond what we imagined.” (Owner, MSME A)

The given result is the direct reflection of the Diffusion of Innovation (DOI) Theory by Rogers and the concepts of relative advantage, in particular, which presupposes the perceived higher value relative to preceding processes that facilitates the adoption. Direct associations between digital technologies and incomes and competition were made by MSME entrepreneurs. Second, the adoption of technology as a kind of strategic resource can be discussed in terms of the Resource-Based View (RBV) in terms of its value and inimitable nature when it is justified by unique business models. In most instances, MSME firms in Indonesia are integrated into the local markets and market reach is thus considered a rare and imitable resource that offers the means of differentiation. Literature also corroborates this: a study (Naibaho et al., 2025) suggests that the levels of customer satisfaction and performance outcomes are highly promoted by digital literacy and technology adoption to small firm. The motives behind adoption are not merely due to efficiency, but are related to ensuring that MSMEs are afforded the best chance to play a bigger role in a digital economy that has appreciated the importance of being connected and fast.

Barriers and Resistance to Change

However, despite the perceived benefits, a number of MSMEs have had challenges in adopting the technology. These aspects included shortage of financial investment in technology, low inculcation of digital capacities and a culture that was accustomed to the traditional industrialistic culture. This fear of errors, being a victim of a scam or even lose control of new systems is especially common amongst older entrepreneurs, according to these researchers. Poor internet connectivity also acted as a barrier to those in rural areas due to the infrastructural obstacles. And opposition was not only of the technological nature: Walking into shops most small business owners claimed they needed face to face relationships, and relationship built on trust with their clients, and that digital transactions were something that could destroy it.

Interview Excerpt:

I understand that lots of people use QRIS or digital payments, and it seems to me confusing. I continue to favor cash, as it is simplified and I do not need to problematize mistakes.
(Owner, MSME B)

It is this theme that underlines the degree of complication and fit of DoI. The adoption effectively stalls at a slow pace when technologies are considered too complicated or not to be integrated with existing-business operations. Moreover, a structural explanation is found in the Technology Organization Environment (TOE model): Technologies may or may not be there (technological factor), but organizational readiness (skills, abilities, willingness of management) and environment enabling conditions (infrastructure, facilitating policies) ultimately determine the outcomes of the adoption. The relevance of the cultural resistance is supported by the analysis provided by STS which only proves the fact that technology is closely linked with the values of humans and social organisation. To MSMEs,

digital application is not only a tools problem, it entails raising digital technology literacy levels, low cost and matching technology to cultural norms of trust and relational exchange.

Leadership Adaptation and Managerial Innovation

Leadership was one of the factors that became very apparent between the successful MSMEs and the struggling ones. Owner-managers who took risks, delegated digital responsibilities and reengineered their workflows were able to adapt quicker and better. Leaders who engaged younger, more digitally savvy family members or employees to embrace the technology had less trouble with transitions. Adaptation of leadership was not only supporting technology, but also in rethinking how the decisions made by managers were executed. There were leaders who acknowledged resistance in the beginning until they saw the writings on the wall to say that you know what, we have to shift in order to survive.

Interview Excerpt:

“I asked my son to manage our online store because he understands technology better. At first, I was afraid to let go, but I realized the business needed to adapt. Now we have a system that runs smoother than before.” (Owner, MSME C)

This result is consistent with Dynamic Capabilities Theory. Leaders were able to do so by sensing opportunities (e.g., understanding the importance of digital platforms), seizing them (e.g., mobilizing resources and devolving authority), and reconfiguring their organizational structures (e.g., redefining roles and workflows). Leadership adaptation now emerges as a dynamic capability per se. This point also resonates with the metaphor of knowledge-based view (KBV), as a knowledge transfer (from digital literate new generations to traditional owners) highlights how knowledge is transformed into a strategic resource. Leadership is a bottleneck or driver of digital adoption in MSMEs (Teece, 2018). In the MSME environment in Indonesia, open, participative and adaptive leadership will produce cultural and management ambience that provides proper condition for the aim of innovation.

Employee Engagement and Digital Skills

Employee preparedness and motivation were cited time and again within key drivers of effective digital transformation. Even MSMEs that did fun, small trainings saw better outcomes - staff became less scared and more comfortable using digital tools. Conversely, organizations which neglected to train their people would end up being unable to derive value from a technology or, worse, face internal protest. "In fact, smaller teams were often able to get more engagement because employees were directly involved in customer service and daily operations, which so directly benefited from the digital tools."

Interview Excerpt:

“At first, my employees were hesitant about using the new POS system. But after short training sessions, they became more confident, and now they actually prefer it because it makes their work faster.” (Manager, MSME D)

This happens to agree with the (TOE approach and) the Socio-Technical Systems view. It should be prepared internally within the company in terms of skills, training and leadership. Involved employees reduce perceived complexity (DoI) and attain a sociotechnical fit of technology in workpractices. In KBV perspective, digital competence of employees is a form of tacit knowledge which when acquired, becomes an inimitable asset in nurturing competitiveness. The outcome is reflective of broader literature on digitalisation, which indicates that human capital of organizations is a determinant factor in influencing these technology related investments whether the investments will lead to an improvement in performance.

Customer Trust and Relationship Building

SMEs were left with customer confidence at its core even during the digitalisation era. The owners claimed that it was not always about efficiency, but also about satisfying customers who are becoming more and more demanding in obtaining faster service, better communication and transparency. Customers responded to those businesses that used technology to be more responsive, and personal. Conversely, MSMEs that adopted digital systems without getting married to human centred service would find themselves having frustrated clients.

Interview Excerpt:

I was shocked to find customers send us a direct message on Instagram and we responded promptly. According to them, they perceived our brand as closer to them due to our responsiveness in comparison to large organizations. (Owner, MSME E)

This is also in favor of tradition of STS which advocates that the implementation of technology must be considered considering the humane and cultural aspects. Digital adoption is a cause and effect of customer confidence in MSMEs at the same time. Only digital tools that are used to enhance relational dynamics, as well as, enhance authenticity, have a value. This is a continuation of the Resource Based View due to the fact that trust is an intangible resource in itself and provides competitive advantage and this is possible in the digital world through engagement. This conclusion is supported by the results obtained in the digital marketing underling by showing that customer-oriented innovation strengthens loyalty and differentiation, especially in the highly competitive environment MSMEs need to compete with larger players.

Sustainability and Competitive Advantage

Those MSMEs which successfully integrated innovation and technology into the management demonstrated more resilience, particularly during a crisis, such as the COVID-19 pandemic. The interim business that moved easily with the help of the digital adoption offered alternative sources of revenue and tolerance to immediate changes in demand. Owners emphasized that the digital preparedness provided short-term gains, but also the possibility of greater security in the long term and opportunities to predict and react to environmental turbulence.

Interview Excerpt:

“When the pandemic hit, most of our sales were through online platforms. If we hadn’t gone digital earlier, I don’t think we would have survived.” (Owner, MSME F)

This finding highlights the core aspect of the contribution of Dynamic Capabilities because MSMEs that had evolved sensing, seizing, and reconfiguring capabilities were better placed to survive shocks. It also states merely how digital properties along with knowledge and the dynamic leadership serve as a driver of continuous competencies advantages (develops RBV and KBV). This too is connected to broader discussions of sustainability: MSMEs that incorporate technology into their core operational management functions do not only expand but also establish business-stable futures in unpredictable business climates. Digital resilience literature has noted that technological adoption offers agility to small businesses, enabling them to survive crises, so that digital transformation is increasingly becoming a survival, rather than a growth issue.

CONCLUSION AND SUGGESTION

Conclusion

This research demonstrates that the integration of innovation and technology into MSME management in Indonesia poses a challenge as well as an opportunity. MSMEs The driving force behind the Indonesian economy, MSMEs are the largest generators of employment and the largest contributor to the gross domestic product (GDP), although their competitiveness in the digital era has been inconsistent. Findings indicate that utilitarian value (e.g., market access, efficiency gain, customer satisfaction) plays a significant role in the adoption decision. But there are obstacles to wide use, obstacles like low digital literacy, poverty, lack of infrastructure and, in the end, people who are used to doing things the old way. Last but not least, the study provides evidence that leadership can effectively benefit from leadership, dynamic leadership capabilities of as such and that yield to determine derivative following, digital tools to be applied effectively to managerial practices by upper echelon managers. Delegating, reorganizing processes and adopting new risks were among the main ways leaders were fostering innovation and making their companies more resilient. On top of this, engaging employees and upskilling them in digital was also critical as, the speakers said, technologies didn’t deliver unless you had a people who are skilled, confident and motivated. In addition to the internal practices, the findings illustrate the importance of customer trust: MSMEs that signaled their transparency, responsiveness, and authenticity on digital platforms were better able to enhance their loyalty and differentiation. In terms of theory the study provides support for the multidimensionality of perceptions. The RBV and KBV explain how technology and human capital are bases of advantage. These resources are pooled, modified and reconfigured within

the theory of dynamic capabilities, which evolved to deal with this question of how they get launched, adjusted and reconfigured in a turbulent environment. According to the Diffusion of Innovation Theory, innovation is adopted because of the relative advantages, compatibility, complexity, trialability, and observability associated with it. The TOE framework proposes that technology, organization and environment (TOE) coherence (or incoherence) impacts on adoption outcomes. Finally, the Socio-Technical Systems model emphasizes the agency of living with the dual tension between sustainable innovative leaders, employees, and customers. In conclusion, the findings suggest that if Indonesian MSMEs are looking to digitalize their business, they are not only use the technologies but more apply these into the heart of managerial functions that the values are adaptive, humanistically device and strategically-aligned. That part of the MSMEs, which finds the way to adapt, are not just more competitive today, but also more safe in tomorrow... unsure how much though.

Suggestions

Based on the findings, several recommendations are proposed for different stakeholders:

1. For MSME Owners and Managers
 - a. Promote adaptive leadership through openness to change, delegating tasks, and use of younger or digitally-enabled staff.
 - b. Invest in fostering digital literacy and employee skills, establishing and learning from doing, through ongoing training, mentoring, apprenticeship.
 - c. Incorporate use of the digital tools not as add-ons but as part of planning, organizing, leading, and controlling.
 - d. To keep relationships with customers trust-based, align technology adoption and human-centered practices.
2. For Policymakers and Government Agencies
 - a. Strengthen digital literacy programmes, and offer cost effective and accessible training relative to MSMEs, in both urban and rural.
 - b. Enhance infrastructure, especially among areas with poor internet access, to eliminate infrastructure barriers to adoption.
 - c. Putting in place financial incentives, subsidies or low-interest loans so that MSMEs can invest in digital technology.
 - d. Streamline regulations for e-commerce and fintech to allow more smaller businesses to join in.
3. For Business Associations and Support Organizations
 - a. Establish peer-learning networks to support MSMEs to share experiences, learn from success stories and see the potential benefits of digital uptake.
 - b. Create incubation and mentoring programs that include not just the technology but also the managerial advice on how to inculcate it.
 - c. Foster collaborations between MSMEs and technology providers to develop solutions that are inexpensive, easy to use, and suited for small business application.
4. For Future Research
 - a. Investigate longitudinal research design to investigate how MSMEs preserve digital transformation in the long run and to see how dynamic capabilities develop.
 - b. Contrast different types of sector (culinary, retail, crafts, services) to understand how industry specific dynamics patterns influence the adoption.
 - c. Explore the impact of generational differences in family businesses on the family owned MSMEs, as transfer of knowledge between older and younger members becomes important for digital innovation.

Explore customers' perspectives further to understand the impact of digital transformation on trust, loyalty, and brand equity in the long run from MSMEs.

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