

Dynamic Capability In Artificial Intelligence Adoption Among Local MSMEs: A Qualitative Study of 8 MSMEs In Manado City

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ABSTRACT

The rise of generative Artificial Intelligence (AI) has opened new opportunities for Micro, Small, and Medium Enterprises (MSMEs) to improve the efficiency of promotion, customer service, and business management. However, the readiness of local MSMEs to sense, seize, and adapt to this technology remains poorly understood, particularly among cross-sectoral MSMEs in non-metropolitan cities such as Manado. This study aims to describe the dynamic capability process—sensing, seizing, and reconfiguring—in AI adoption among MSMEs in Manado City. The study employed a descriptive qualitative approach using semi-structured interviews with 8 MSME actors from various sectors (culinary, fashion, café, retail, tourism, beauty, automotive, and home-based bakery). Data were analyzed thematically through the stages of data reduction, data display, and conclusion drawing. The findings reveal a sharp dynamic capability gap across sectors: MSMEs that interact directly with digital-savvy customers (café, fashion, tourism, beauty) show more mature sensing and seizing capability, whereas MSMEs based on routine physical transactions (grocery stores, motorcycle repair shops) remain at a very limited sensing stage. Across all informants, reconfiguring capability remains weak, as AI is so far used only for promotion and content creation rather than core business processes, and adoption is heavily dependent on support from more digitally literate family members. This study contributes to a contextual understanding of the AI adoption gap among regional MSMEs and recommends a differentiated training approach based on sector characteristics.

ARTICLE HISTORY

Published September 1st 2026



Check for updates

KEYWORDS

Dynamic capability; artificial intelligence adoption; MSMEs; qualitative study; Manado City.

ARTICLE LICENCE

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1. Introduction

MSMEs are a vital pillar of Manado City's economy, yet most operators still run their businesses in a conventional manner amid rapidly shifting markets, including the entry of generative Artificial Intelligence (AI) into everyday business practice (Tambunan, 2023; Awaluddin et al., 2026; Ko et al., 2025; Noor et al. 2025). Recent systematic reviews indicate that AI adoption generally improves MSMEs' operational efficiency, marketing personalization, and data-driven decision-making, but the adoption process is still hindered by limited technical capability, financial resources, and digital literacy among business owners (Rahayu et al., 2025; Arsenio et al., 2024). Several researchers refer to this phenomenon as an "adoption paradox": the benefits of AI are widely acknowledged, yet real-world implementation remains slow and uneven (Rahayu et al., 2025; Syam et al., 2026; Tilman et al., 2025; Puspita et al., 2026; Alie, 2025).

Research on AI adoption among Indonesian MSMEs has so far been dominated by two approaches: nationwide systematic literature reviews (Fitria et al., 2025; Arsenio et al., 2024) and quantitative surveys of adoption determinants such as top management commitment, staff adaptability, and perceived ease of use (Santosa & Surgawati, 2024). These approaches are effective in mapping adoption patterns in aggregate, but they have not extensively uncovered how the adoption process actually unfolds on a daily basis among MSME actors with differing sectoral characteristics and local economic contexts, particularly in non-metropolitan cities such as Manado. The dynamic capability framework—sensing, seizing, reconfiguring (Teece, 1997)—is more relevant for dissecting this process contextually, as previously applied to MSMEs in Vietnam by Vo Thai, Hong-Hue, and Tran (2024), yet its application to the context of AI adoption among MSMEs in eastern Indonesia remains very limited.

Based on this gap, this study aims to describe how dynamic capability—in the form of sensing, seizing, and reconfiguring—is practiced by cross-sectoral MSME actors in Manado City in responding to the presence of AI technology, including the barriers they face and the support they will need going forward.

2. Methodology

This study employed a descriptive qualitative approach with a case study design (Yin, 2018) to understand the AI adoption process contextually among MSME actors. Informants were purposively selected, comprising 8 MSME actors in Manado City representing a range of business sectors, with an average business age of 4–10 years.

Data were collected through semi-structured interviews covering seven aspects: business profile, business change, sensing, seizing, reconfiguring, barriers, and future expectations regarding AI. Data analysis followed the interactive model of Miles, Huberman, and Saldaña (2014) data reduction, data display, and conclusion drawing/verification—with cross-case thematic analysis organized around the three dimensions of dynamic capability. Data trustworthiness was established through source triangulation across informants from across sectors.

2.1 Research Participants

Informants were purposively selected based on the following criteria: (a) being the owner or primary manager of the business, directly involved in operational decision-making; (b) the business having operated for at least two years, so that the informant had sufficient business experience to reflect on changes resulting from the presence of AI; and (c) representing different business sectors to capture variation in transaction characteristics businesses interacting directly with digital-savvy customers (coffee shops, fashion, tour services, beauty salons) and businesses based on routine physical transactions (grocery stores, motorcycle repair shops, small stalls, home-based bakeries).

Table 1. Summary of Informant Profiles

No.	Name (Pseudonym)	Business Sector	Customer Interaction Characteristics
1	Mr. Brian	Coffee Shop	Digital-savvy (visual, tourists)
2	Mr. Hendra	Fashion Store	Digital-savvy (visual, tourists)
3	Mr. Robby	Tour Service	Digital-savvy (tourists)
4	Mrs. Uli	Beauty Salon	Digital-savvy (visual)
5	Mrs. Siska	Grocery Store	Routine physical transactions
6	Mr. Yance	Motorcycle Repair Shop	Routine physical transactions
7	Mrs. Meiske	Small Stall (Warung)	Routine physical transactions
8	Mrs. Yuli	Home-based Bakery	Routine physical transactions

2.2 Data Collection Procedure

Semi-structured interviews were conducted face-to-face at each informant's place of business, so that the researcher could simultaneously observe the work context and how informants used digital devices in their daily routines. The interview guide was developed based on a review of the literature on *dynamic capability* (Teece, 1997) and the *Technology Organization Environment* (TOE) framework, and was then reviewed again before use in the field to ensure the questions could be understood by informants with diverse educational backgrounds. Each interview session was recorded with the informant's consent (*informed consent*) and supplemented with field notes (*field notes*) to capture non-verbal context, such as how informants interacted with digital devices during the interview.

2.3 Data Analysis Technique

Data analysis was conducted thematically following the interactive model of Miles, Huberman, and Saldaña (2014) through three stages occurring simultaneously. First, data reduction was carried out by transcribing all interview recordings verbatim, followed by *open coding* of informant statements relevant to the AI adoption process. Second, the codes were grouped into thematic categories referring to the three dimensions of *dynamic capability* (*sensing, seizing, reconfiguring*) as well as two additional categories—barriers and future expectations then presented as a cross-case matrix (*cross-case matrix*) to facilitate comparison of patterns across sectors. Third, conclusions were drawn iteratively by comparing patterns

that emerged between the group of *digital-savvy* MSMEs and the group of MSMEs based on routine physical transactions, while re-verifying the interpretation against the original transcripts to minimize researcher interpretation bias.

2.4 Data Trustworthiness

Data trustworthiness (*trustworthiness*) was maintained through four criteria commonly used in qualitative research (Lincoln & Guba, 1985). Credibility was achieved through source triangulation, comparing statements among informants across sectors to confirm consistency or contrast in the findings. Transferability (*transferability*) was pursued through thick description (*thick description*) of the context of each business, so that readers can assess the relevance of the findings to other, similar contexts. Dependability (*dependability*) was maintained by systematically documenting the entire data collection and analysis process, while confirmability was achieved by discussing thematic interpretations with fellow researchers to minimize subjective bias in interpreting the data. All informants participated voluntarily after receiving an explanation of the study's purpose, and informants' true identities were disguised using pseudonyms to maintain confidentiality.

3. Results and Discussion

3.1 Sensing: Awareness Gap Based on Sector Characteristics

The findings show that awareness of AI varies considerably and correlates with the extent to which business actors are exposed to digital-savvy customers. Informants in sectors that interact directly with visual trends and tourists coffee shops, fashion, tour services, and beauty salons demonstrated mature sensing capability, even using technical terminology accurately, as shown in Data 1:

Data 1

"I know it well; I often use ChatGPT and Canva AI for the shop's promotions." — Mr. Brian (Coffee Shop Owner)

"AI is very useful for generating new motif design ideas and translating product descriptions into a foreign language for tourists." — Mr. Hendra (Fashion Store Owner)

In contrast, informants in sectors based on routine physical transactions and daily local customers grocery stores and motorcycle repair shops showed very limited sensing, and were not even directly familiar with the term AI, as shown in Data 2:

Data 2

"I don't really understand the term AI; what matters to me is that the shop keeps running and the goods are properly recorded." — Ms. Siska (Grocery Store Owner)

"I don't really understand the term AI; I only know about the internet and Google search." — Mr. Yance (Repair Shop Owner)

This pattern is consistent with the TOE framework, in which environmental pressure, in this case, customer behavior demanding visual content and quick responses that serves as the main driver of sensing capability (Fitria et al., 2025), rather than the owner's age or length of business alone.

Theoretically, this pattern confirms that *sensing capability* (Teece, 1997) does not emerge linearly with increasing business age, but is triggered by market signals received by business actors through daily interaction with customers. MSMEs whose customers demand attractive visual content or foreign-language services receive market pressure that directly drives them to seek technological solutions, so that *sensing capability* forms reactively in response to customer needs rather than through proactive exploration of the technology itself. Conversely, the absence of similar pressure among MSMEs with routine physical transactions means the need for AI is not yet felt as urgent, even though technically, opportunities for its use (e.g., automated inventory recording) are already available. The implication is that the *sensing capability* gap among Manado's MSMEs is better understood as a structural issue related to sector market characteristics, rather than merely a deficiency in individual business actors' capacity.

3.2 Seizing: Utilization Still Limited to Promotion

Of the 8 informants, 6 had tried generative AI applications (ChatGPT, Canva AI, or social media text-suggestion features), while 2 informants (the grocery store and the repair shop) had never used them at all. However, all reported

usage was concentrated on promotion and content-related activities drafting captions, discount posters, decoration ideas, or translating text into foreign languages and had not yet reached core business processes such as bookkeeping, inventory management, or operational diagnostics, as shown below (Data 3):

Data 3

"It's used to write English-language promotional text for our clothing products and to generate ideas for exhibition content." — Mr. Hendra (Fashion Store Owner)

"AI could help mechanics automatically record customer service history and diagnose fuel-injection error codes" — though this remains an aspiration rather than a current practice — Mr. Yance (Repair Shop Owner)

This finding reinforces Rahayu., et al. (2025) observation of an AI adoption paradox among MSMEs: usage tends to stop at the most easily accessible function (freemium-based visual marketing), while AI's potential for core operational efficiency remains largely unexplored by small business actors.

These findings show that the *seizing capability* formed among informants remains opportunistic and shallow, rather than strategic as intended in Teece's (1997) original concept, which requires a commitment of resources to translate opportunities into genuine business value. AI utilization limited to free (*freemium*) features and promotional functions indicates that the *seizing* process among local MSMEs stops at the "trying" stage without progressing to "integrating." The gap between recognizing AI's benefits and the decision to genuinely transform core business processes explains why the adoption paradox (Rahayu et al., 2025) persists even as awareness of AI continues to grow: shallow *seizing capability* means AI's benefits stop at a cosmetic level (promotional appearance) and have not yet touched the operational efficiency genuinely promised by the technology.

3.3 Reconfiguring: Shallow Change and Reliance on Family Support

Reconfiguring capability among all informants was found to be weak, as the changes observed were generally limited to a shift from manual record keeping to digital devices, rather than an actual restructuring of business processes. Notably, more digitally literate family members (children or children-in-law) emerged as adoption facilitators in three of the eight cases, as shown in Data 4:

Data 4

"The operators (the owner and her child) have basic phone skills, but for more complex AI features we still need to learn." — Ms. Meiske (Food Stall Owner)

"The operator (a housewife) is assisted by her child in searching for digital ideas." — Ms. Yuli (Bakery Owner)

This pattern indicates that reconfiguring capability among family-run MSMEs in Manado does not stem solely from the owners' internal capability, but is mediated by family networks as an informal resource, a nuance not widely captured in large-scale, survey based studies of AI adoption (Santosa & Surgawati, 2024).

These findings show that *reconfiguring capability* among family MSMEs in Manado is fragile (*fragile*), as it depends on the availability of digitally literate family members rather than on capability internalized within the owner's routine work practices. In other words, the capacity to restructure resources as required by Teece (1997) does not yet fully belong to the business organization itself, but rather depends on specific individuals outside the business's formal structure. This condition creates a sustainability risk: if the family member who has served as the digital facilitator is no longer available, the AI adoption capability that has been built up could disappear along with them. The shallowness of *reconfiguring* is also evident in the form the change takes—limited to digitizing records rather than restructuring workflows or business models—so that AI currently functions more as an add-on tool (*add-on*) than as a driver of change in how the business operates.

3.3.1 Barriers: Time, Literacy, and Authenticity Concerns

The barriers that emerged varied according to the physical nature of work in each sector. Home-based culinary and repair shop operators highlighted practical, physically grounded barriers, as shown below (Data 5):

Data 5

"My hands are dirty from the dough, so it's hard to hold a phone while working." — Ms. Yuli (Bakery Owner)

Meanwhile, cognitive and psychological barriers were more prominent among MSMEs with minimal technology exposure, taking the form of fear of making mistakes and the perception that the technology is irrelevant to their business scale:

Data 6

"I'd be interested if the app were in Indonesian and free, but I'm hesitant because I feel technologically illiterate (gaptek)." — Ms. Siska (Grocery Store Owner)

Interestingly, cost was not a major barrier for most informants, as they relied on free (freemium) versions except for businesses requiring specialized automation systems such as booking chatbots (tour services) or repair shop software. Other, sector specific concerns also emerged: fashion-sector actors worried that traditional motifs could be digitally copied, while culinary actors worried that AI generated output would not match the authentic taste or form of their products indicating that resistance to AI among local cultural MSMEs is not solely a matter of technical skill, but also one of identity and product authenticity.

Mapped onto the Technology-Organization-Environment (TOE) framework, the practical-physical and cognitive-psychological barriers found reflect the organizational dimension namely limited time and digital literacy among business actors—while concerns over product authenticity point to an additional dimension rarely discussed in mainstream AI-adoption literature for MSMEs: the dimension of cultural identity and creative ownership. These findings indicate that resistance to AI among MSMEs based on distinctive local products, such as traditional fashion motifs and home-cooked culinary flavors, cannot be addressed with technical training alone, because the root of the issue is affective and tied to a sense of ownership over the product. Accordingly, AI-adoption assistance strategies for locally rooted MSMEs need to emphasize that AI serves as a tool not a replacement for the creativity and authenticity that constitute the business's main selling point.

3.3.2 Future Expectations

All informants including those who had never used AI viewed AI as something that will become important for MSMEs going forward, although the perceived urgency differed across sectors. The most frequently expressed need was for practical, free, and plain-language training, ideally delivered through personal mentoring from students or local educational institutions representing a direct opportunity for vocational higher education institutions such as Manado State Polytechnic to contribute through community service programs.

Informants' preference for training that is practical, free, and personal indicates that the formation of dynamic capability among MSMEs cannot occur automatically simply because technology is available, but requires a structured, sustained learning mechanism, as emphasized in the dynamic capability literature. The need for personal mentoring also aligns with the finding on the role of family as an informal facilitator in the reconfiguring aspect, which shows that MSME actors are more comfortable learning through direct, gradual interaction than through generic, mass-oriented training materials. These findings reinforce the urgency of the role of vocational higher-education institutions as providers of assistance personalized to sector characteristics, rather than the uniform training commonly offered to MSMEs in general.

4. Conclusion

This study finds that the dynamic capability of Manado City's MSMEs in responding to AI is uneven across both dimensions and sectors. Sensing capability develops faster among MSMEs that interact directly with digital-savvy customers (café, fashion, culture, tourism, beauty), while MSMEs based on routine physical transactions (grocery stores, repair shops) lag behind at the most basic stage. Seizing capability across all informants remains concentrated on promotion and content functions, without yet reaching core business processes. Reconfiguring capability is generally shallow and largely mediated by informal support from more digitally literate family members, rather than by the business owners' internal capability alone.

These findings enrich the application of Dynamic Capability Theory (Teece, 1997) to the context of technology adoption among regional MSMEs, while both confirming and refining the AI adoption paradox identified by Rahayu et al.

(2025) by showing that this paradox is patterned according to sector characteristics and family business structure. Practically, this study recommends a differentiated training approach: digital-facing MSME sectors require further mentoring to extend AI use into core business processes, while physical-routine MSME sectors require very simple, personalized basic literacy training. This study is limited to eight cases in a single city, so generalization should be made with caution; future research is encouraged to test these patterns quantitatively on a larger population of Manado's MSMEs.

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