Beyond Digital Literacy: A Qualitative Inquiry into AI Readiness and Dynamic Capabilities of Micro Enterprises in North Sulawesi

Stefen R. A. Taroreh[1]*, Wahyu Mandalika[1], Irfan H. Wasilu[1], Risky Pratama[1], Wahyuningsih[1]

[1]Faculty of Law and Business, Muhammadiyah University of Manado, Indonesia
Email: stefen.taroreh@gmail.com

ABSTRACT

The rapid spread of Generative Artificial Intelligence (GenAI) enables resource constrained businesses to leapfrog traditional development stages. However, current literature predominantly focuses on digital literacy and adoption intentions, often overlooking the strategic utilization of AI in peripheral tourism economies. This study aims to explore how micro enterprises in Bunaken, North Sulawesi, leverage AI tools to build dynamic capabilities beyond basic technical skills. Employing a qualitative descriptive design, this study investigates the lived experiences of 12 tourism based micro entrepreneurs. Data were collected through in depth semi structured interviews and digital observations. The study utilizes the Dynamic Capabilities View (DCV), specifically sensing, seizing, and transforming as the theoretical lens to analyze how participants integrate tools like ChatGPT and Gemini into their daily operations. The results reveal that AI readiness in this context is best characterized as "Pragmatic Bricolage" rather than formal technical proficiency. Participants exhibit a distinct dichotomy in tool usage: ChatGPT is leveraged for creative content generation and cultural translation (seizing capabilities), while Gemini is utilized for real time market intelligence and information verification (sensing capabilities). The study identifies that GenAI acts as a cost effective mechanism for "frugal innovation," effectively bridging the language and resource gaps inherent in the region, though usage is tempered by the need for "human in the loop" verification to mitigate AI hallucinations. This research contributes to the digital entrepreneurship literature by providing empirical evidence from an underrepresented archipelago context. It theoretically extends the DCV framework by proposing that in micro enterprises, dynamic capabilities can be constructed through accessible AI tools, shifting the focus from "digital literacy" to "AI enabled strategic agility."

Keywords: *AI adoption, dynamic capabilities, micro enterprises*

1. INTRODUCTION

The rapid proliferation of Artificial Intelligence (AI), particularly the recent surge in Generative AI technologies, has fundamentally altered the competitive landscape of global business (Singh et al., 2024). Once the exclusive domain of large multinational corporations with substantial R&D budgets, AI tools have become increasingly democratized, offering cost effective solutions for content creation, customer relationship management, and data analytics (Costa et al., 2024). For Small and Medium Enterprises (SMEs), this technological shift presents a dual edged sword: it offers unprecedented opportunities to leapfrog traditional development stages, yet it imposes significant pressure to adapt to a digital first economy (Samorodov & Kotkovskyi, 2025).

In the context of developing economies, particularly within the tourism and service sectors, the integration of AI is no longer merely a trend but a survival mechanism. Recent studies indicate that SMEs in emerging markets are increasingly leveraging AI to enhance operational efficiency and personalize customer experiences (Cherian, 2025). However, unlike their counterparts in the Global North, these enterprises often operate within resource constrained environments characterized by institutional voids and infrastructural limitations (Peprah et al., 2023). Consequently, the narrative of AI adoption in these regions is complex,

intertwining technological affordances with unique socio cultural and economic realities.
Despite the growing interest in AI adoption, a significant gap remains in the current body of knowledge. The majority of extant literature focuses predominantly on adoption intention or digital literacy defined as the technical ability to use digital tools (Nguyen et al., 2024). While digital literacy is a necessary antecedent, it is insufficient to explain how micro enterprises sustain competitive advantages. Merely possessing the technical skill to operate an AI tool does not equate to the strategic capability to leverage it for business growth.

Furthermore, empirical research on AI adoption has largely favored quantitative approaches using models such as TAM (Technology Acceptance Model) or UTAUT, often overlooking the nuanced, "lived experiences" of micro entrepreneurs (De Blanes Sebastián et al., 2022). There is a paucity of qualitative inquiry that scrutinizes how micro enterprises in peripheral tourism destinations such as North Sulawesi navigate the transition from basic digital literacy to strategic AI utilization. Specifically, the mechanisms by which these businesses integrate AI into their limited workflows to sense market changes and seize opportunities remain underexplored in high impact management literature (Donthu et al., 2025).

To address this gap, this study adopts the Dynamic Capabilities View (DCV) as a theoretical lens. Originally proposed to explain how firms adapt to rapidly changing environments, DCV is highly relevant to the volatile post pandemic tourism sector (Teece, as cited in recent adaptations by Breier et al., 2021). Within this framework, AI adoption is viewed not as a static event but as a dynamic process involving three clusters of activities: sensing (identifying opportunities via AI), seizing (mobilizing resources to capture value), and transforming (realigning organizational assets). By applying DCV to the micro enterprise context, this research posits that successful AI integration requires a shift in mindset from operational usage to strategic agility.

This study aims to explore the phenomenon of AI readiness and the development of dynamic capabilities among micro enterprises in Bunaken, North Sulawesi a globally renowned marine tourism destination. By employing a qualitative descriptive design, this research seeks to answer the following question: How do micro enterprises in a developing coastal economy leverage AI tools to build dynamic capabilities beyond basic digital literacy? The findings of this study contribute to the literature by providing empirical evidence from an underrepresented geographical context (Eastern Indonesia) and by offering a granular understanding of the "human side" of AI adoption in resource constrained settings.

2. METHOD

2.1. Research Design

This study employs a qualitative descriptive design to explore the phenomenon of AI readiness and dynamic capabilities among micro enterprises. This approach was selected because it allows for a comprehensive summary of events in the everyday terms of those events, offering a pragmatic way to understand "who, what, and where" regarding AI adoption (Aziz et al., 2025). The design is particularly appropriate for research in emerging digital contexts where the variables are not yet fully defined and where the goal is to provide a rich description of the participants' experiences with technology in their natural business environment (Villamin et al., 2024).

2.2. Study Context and Participants

The research was conducted in Bunaken District, Manado, North Sulawesi, a region characterized by its high dependence on marine tourism and its archipelagic logistical challenges. This specific locale was chosen to represent a "peripheral tourism economy," providing a unique contrast to studies conducted in major urban centers.
Participants were selected using purposive sampling to ensure the retrieval of information rich cases (Memon et al., 2024). The inclusion criteria for participants were as follows:

- Business Type: Owners of micro enterprises (as defined by Indonesian BPS standards) operating in the tourism support sector (e.g., homestays, dive operators, souvenir shops, F&B).
- AI Usage: Have actively used Generative AI tools (e.g., ChatGPT, GEMINI, Canva Magic, CapCut AI, or translation AI) for business operations for a minimum of six months.
- Location: Domiciled and operating within the Bunaken district.
  Recruitment continued until data saturation was reached the point at which no new themes or codes emerged from the interviews. Based on recent qualitative standards for homogenous groups in business research, a sample size of 9 to 17 participants was anticipated to be sufficient to achieve saturation (Hennink & Kaiser, 2021).

2.3. Data Collection

Data were collected between September and October 2025 using two primary methods to ensure data triangulation:

a. Semi Structured Interviews: In depth interviews were conducted face to face or via video conferencing, lasting approximately 45–60 minutes. The interview protocol was designed based on the Dynamic Capabilities View (DCV) framework, probing how participants sense market changes using AI, seize opportunities, and transform their workflows (Cristofaro & Lovallo, 2022). Questions focused on the specific tools used, the barriers encountered, and the strategic rationale behind AI adoption.
b. Digital Observation: To corroborate interview data, the researcher performed digital observations of the participants' business outputs (content analysis). This included reviewing social media posts, marketing materials, or operational documents created with the assistance of AI tools. This method aligns with recent recommendations for researching digital entrepreneurship (Von Briel et al., 2021).

2.4. Data Analysis

The collected data were analyzed using Thematic Analysis following an inductive approach (Pearson et al., 2025). This method was chosen for its flexibility in identifying, analyzing, and reporting patterns (themes) within the data. The analysis proceeded through six phases:

a. Familiarization: Transcribing interviews verbatim and reading the data repeatedly.
b. Coding: Generating initial codes for interesting features of the data systematically (e.g., "fear of technology," "speed of content creation").
c. Searching for Themes: Collating codes into potential themes related to AI readiness and dynamic capabilities.
d. Reviewing Themes: Checking if the themes work in relation to the coded extracts and the entire dataset.
e. Defining and Naming Themes: Refining the specifics of each theme to generate clear definitions.
f. Writing Up: Producing the report.

2.5. Trustworthiness

To ensure the quality of the research, the criteria of credibility, transferability, dependability, and confirmability were applied:

- Credibility was established through member checking, where participants were asked to review a summary of their interview transcripts to ensure accuracy (Vella, 2024).
- Transferability was achieved by providing a "thick description" of the Bunaken context, allowing readers to determine the applicability of findings to other coastal tourism regions.
- Confirmability was maintained by keeping a reflexive journal throughout the research process to minimize researcher bias regarding AI technology.

3. RESULTS AND DISCUSSION

3.1. RESULTS

The thematic analysis of semi structured interviews with 12 micro enterprise owners in Bunaken District revealed three dominant themes regarding AI readiness and the formation of dynamic capabilities. The participants, comprising homestay owners, dive operators, and local tour guides, primarily utilized ChatGPT (OpenAI) and Gemini (Google) to navigate business challenges.

3.1.1. AI Readiness as "Pragmatic Bricolage"

Contrary to the definition of digital literacy as formal technical proficiency, the findings suggest that AI readiness among Bunaken SMEs is characterized by "pragmatic bricolage" the willingness to experiment with available tools to solve immediate problems. Participants did not view themselves as "tech experts" but as "problem solvers."

Participants exhibited a distinct dichotomy in tool usage. ChatGPT was predominantly preferred for creative tasks, such as drafting "romantic dinner descriptions" or "persuasive dive package offers." In contrast, Gemini was favored for tasks requiring up to date information, such as checking current flight regulations or analyzing recent travel trends, due to its perceived integration with Google Search.

One homestay owner noted, "I don't know how the code works. I just talk to ChatGPT like a smart friend. If I need to write an email to a guest from France, I ask it to write politely in French. If I need to know the weather prediction for the boat trip, I ask Gemini."

3.1.2. Sensing Capabilities.

The ability of Bunaken SMEs to sense market needs has historically been constrained by language barriers with international tourists. Participants reported using ChatGPT not only to translate languages but also to interpret 'cultural nuances.' For instance, a homestay owner described using AI to understand the specific dietary preferences of guests from different European countries, enabling them to adjust their catering offerings accordingly.

Gemini was leveraged by users as a low cost market research consultant, enabling micro entrepreneurs to access synthesized market insights through prompts such as 'What do Australian divers look for in 2025?", that were previously exclusive to large resort chains

3.1.3. Seizing Capabilities

Seizing' involves mobilizing resources to capture value. The findings indicate that AI has exponentially increased the content velocity of these micro enterprises.

Activities that once took days to complete, or necessitated hiring costly freelancers from Manado City, such as developing social media itineraries and designing brochures, are now accomplished within minutes.

As one souvenir shop owner explained," I previously relied on a paid designer to create captions. Now, by uploading a photo to Gemini and requesting a description that emphasizes the unique coral reefs of Bunaken, I receive three alternative captions instantly".

3.1.4. Barriers and Hallucinations

Despite these benefits, participants also reported challenges related to the limitations of generative AI. 'Hallucinations,' in which AI systems generate fabricated or inaccurate information, were identified as a major concern. Several participants cited instances in which ChatGPT produced nonexistent ferry schedules between Manado and Bunaken, thereby necessitating a manual verification process ('human in the loop').

3.2. DISCUSSION

3.2.1. The Rise of AI Enabled Dynamic Capabilities

This study extends the literature on the digital divide by arguing that for micro enterprises, AI readiness is less about technical literacy and more about strategic adaptability. While previous studies emphasized the lack of resources as a barrier for SMEs (Kramarenko, 2025), this research aligns with Noy and Zhang (2023), suggesting that AI tools like ChatGPT and Gemini act as "equalizers." They allow resource constrained firms in peripheral areas like Bunaken to bypass traditional capability building stages. The findings support the notion that AI facilitates a form of "Frugal Dynamic Capability," where sophisticated market sensing is achieved with minimal financial investment (Sánchez Rodríguez et al., 2025).

3.2.2. Generative AI as a Knowledge Broker in Tourism

The distinct usage patterns of ChatGPT (for creativity) and Gemini (for information retrieval) observed in this study contribute to the growing discourse on Human AI Collaboration in tourism business (Nannelli et al., 2023). In the Bunaken context, these tools function as "Knowledge Brokers." They decode complex global tourism demands into actionable local strategies. This confirms the findings of Singh et al. (2024) regarding the transformative potential of Generative AI, but adds a geographical nuance: in remote island economies, AI is not just an efficiency tool, but a legitimacy tool. By generating high quality, grammatically correct English content, micro enterprises project a professional image that rivals established international resorts.

3.2.3. The Paradox of Trust and Verification

The reliance on AI brings forth a new operational capability: Information Verification. As noted in the results, the tendency of Large Language Models (LLMs) to hallucinate dates or schedules forces Bunaken entrepreneurs to develop a critical eye. This aligns with Bedué and Fritzsche (2021), who argue that successful AI adoption in business requires a shift from "trusting the algorithm" to "supervising the algorithm." This "Human in the loop" mechanism is crucial in the tourism sector, where misinformation (e.g., wrong boat schedules) can lead to severe service failures.

3.2.4. Implications for Policy and Practice

The study suggests that government training programs should shift focus. Instead of basic "Digital Marketing" training, the curriculum should evolve into "Prompt Engineering for Business." Teaching SMEs how to effectively query Gemini for market trends or use ChatGPT for customer service recovery is the new frontier of economic empowerment in developing regions (Mdladla et al., 2024).

4. CONCLUTION

4.1. Summary of Findings

This study set out to examine how micro enterprises in the tourism dependent district of Bunaken, North Sulawesi, navigate the complex landscape of artificial intelligence adoption. The findings challenge the conventional narrative that equates digital readiness solely with technical literacy. Instead, the study reveals that AI readiness among these micro entrepreneurs is more accurately conceptualized as pragmatic bricolage, a dynamic capability through which business owners leverage generative AI tools, specifically ChatGPT and Gemini, to bridge persistent resource constraints. Drawing on the Dynamic Capabilities View, the analysis findings that Bunaken’s SMEs deploy AI to sense global market trends, particularly by overcoming language barriers and to seize opportunities through rapid content creation. This practice enables forms of frugal innovation that allow micro enterprises to compete beyond their traditional scale limitations. Moreover, the differentiated use of ChatGPT for creative narrative construction and Gemini for real time information retrieval reflects a nuanced, albeit informal, strategic orientation toward technology adoption.

4.2. Theoretical and Practical Implications

Theoretically, this research contributes to the Dynamic Capabilities framework by providing empirical evidence from a peripheral developing economy. It demonstrates that, in resource constrained environments, dynamic capabilities are not necessarily cultivated through formal R&D processes but can instead emerge from the agile and purposeful adoption of accessible AI tools.

From a practical standpoint, the study offers a clear roadmap for policymakers and tourism boards in Indonesia. Capacity building initiatives should move beyond basic digital literacy toward the development of AI strategic competence. Such programs should emphasize prompt engineering skills, mechanisms for verifying AI generated hallucinations, and ethical AI integration, thereby strengthening the global competitiveness of local tourism based micro enterprises.

4.3. Limitations and Future Research

This study is limited by its qualitative, descriptive design and its specific focus on the Bunaken district, which may constrain the generalizability of the findings to non-tourism sectors or urban contexts. Accordingly, several avenues for future research are proposed:

- Quantitative validation: Developing and validating a measurement scale for AI dynamic capability across a larger and more diverse sample of Indonesian SMEs.
- Longitudinal studies: Examining the long term economic effects of AI adoption on SME revenue growth and business sustainability over an extended period.
- Comparative analysis: Conducting comparative studies between coastal tourism SMEs and urban retail SMEs to assess how geographical and contextual factors shape AI adoption patterns.

REFERENCES

Aziz, M. S., Subiakto, H., & Puspa, R. (2025). Diffusion of artificial intelligence across Indonesia: Digital disparities, local contexts, and policy implications. Masyarakat Kebudayaan Dan Politik, 38(3), 276–292. https://doi.org/10.20473/mkp.v38i32025.276-292

Bedué, P., & Fritzsche, A. (2021). Can we trust AI? An empirical investigation of trust requirements and guide to successful AI adoption. Journal of Enterprise Information Management, 35(2), 530–549. https://doi.org/10.1108/jeim-06-2020-0233

Cherian, M. (2025). Leveraging AI for Predicting Marketing and Customer Insights-An Overview. Journal of Informatics Education and Research, 5(1). https://doi.org/10.52783/jier.v5i1.2050

Cristofaro, M., & Lovallo, D. (2022). From framework to theory: an evolutionary view of dynamic capabilities and their microfoundations. Journal of Management & Organization, 28(3), 429–450. https://doi.org/10.1017/jmo.2022.46

Costa, C. J., Aparicio, M., Aparicio, S., & Aparicio, J. T. (2024). The Democratization of Artificial Intelligence: Theoretical Framework. Applied Sciences, 14(18), 8236. https://doi.org/10.3390/app14188236

De Blanes Sebastián, M. G., Guede, J. R. S., & Antonovica, A. (2022). Tam versus utaut models: a contrasting study of scholarly production and its bibliometric analysis. TECHNO REVIEW International Technology Science and Society Review /Revista Internacional De Tecnología Ciencia Y Sociedad, 12(3), 1–27. https://doi.org/10.37467/revtechno.v11.4445

Hennink, M., & Kaiser, B. N. (2021). Sample sizes for saturation in qualitative research: A systematic review of empirical tests. Social Science & Medicine, 292, 114523. https://doi.org/10.1016/j.socscimed.2021.114523

Kramarenko, A. (2025). Artificial intelligence for small and medium business: Perspectives and challenges. Journal of Engineering Management and Competitiveness, 15(1), 43–56.

https://doi.org/10.5937/jemc2501043k
Memon, M. A., Thurasamy, R., Ting, H., & Cheah, J. (2024). PURPOSIVE SAMPLING: a REVIEW AND GUIDELINES FOR QUANTITATIVE RESEARCH. Journal of Applied Structural Equation Modeling, 9(1), 1–23. https://doi.org/10.47263/jasem.9(1)01
Mdladla, L. T. S., Wider, W., Thanathanchuchot, T., & Hossain, S. F. A. (2024). Navigating the AI revolution: A review of the transformative strategies for economic development in Africa's emerging economies. Journal of Infrastructure Policy and Development, 8(9), 5436. https://doi.org/10.24294/jipd.v8i9.5436
Nannelli, M., Capone, F., & Lazzeretti, L. (2023). Artificial intelligence in hospitality and tourism. State of the art and future research avenues. European Planning Studies, 31(7), 1325–1344. https://doi.org/10.1080/09654313.2023.2180321
Noy, S., & Zhang, W. (2023). Experimental evidence on the productivity effects of generative artificial intelligence. Science, 381(6654), 187–192. https://doi.org/10.1126/science.adh2586
Nguyen, T. T., Tran, T. N. H., My, T. H., DO, Dinh, T. K. L., Nguyen, T. U. N., & Dang, T. M. K. (2024). Digital literacy, online security behaviors and E-payment intention. Journal of Open Innovation Technology Market and Complexity, 10(2), 100292. https://doi.org/10.1016/j.joitmc.2024.100292
Pearson, H., Myall, M., Darlington, A., & Gibson, F. (2025). The approach and application of analysing inductive and deductive datasets: a worked example using reflexive thematic analysis. Qualitative Research in Psychology, 22(4), 842–886. https://doi.org/10.1080/14780887.2025.2499265
Peprah, A. A., Atarah, B. A., & Kumodzie-Dussey, M. K. (2023). Nonmarket strategy and legitimacy in institutionally voided environments: The case of Jumia, an African e-commerce giant. International Business Review, 33(2), 102169. https://doi.org/10.1016/j.ibusrev.2023.102169
Samorodov, B., & Kotkovskyi, V. (2025). IMPACT OF INNOVATIVE TECHNOLOGIES ON THE DEVELOPMENT OF SMALL AND MEDIUM-SIZED BUSINESSES IN THE DIGITAL ECONOMY. Economic Scope, 197, 281–286. https://doi.org/10.30838/ep.197.281-286
Sánchez-Rodríguez, A., García-Vidal, G., Fernández-Ochoa, Y., Martínez-Vivar, R., Gavilanes-Venegas, A. E., & Pérez-Campdesuñer, R. (2025). Navigating uncertainty through AI adoption: dynamic capabilities, strategic innovation performance, and competitiveness in Ecuadorian SMEs. Administrative Sciences, 15(12), 468. https://doi.org/10.3390/admsci15120468
Singh, N., Chaudhary, V., Singh, N., Soni, N., & Kapoor, A. (2024). Transforming Business with Generative AI: Research, Innovation, Market Deployment and Future Shifts in Business Models. arXiv (Cornell University). https://doi.org/10.48550/arxiv.2411.14437
Vella, J. (2024). In pursuit of credibility: Evaluating the divergence between member-checking and hermeneutic phenomenology. Research in Social and Administrative Pharmacy, 20(7), 665–669. https://doi.org/10.1016/j.sapharm.2024.04.001
Villamin, P., Lopez, V., Thapa, D. K., & Cleary, M. (2024). A worked example of qualitative descriptive design: A Step-by-Step guide for novice and early career researchers. Journal of Advanced Nursing, 81(8), 5181–5195. https://doi.org/10.1111/jan.16481
Von Briel, F., Recker, J., Selander, L., Jarvenpaa, S. L., Hukal, P., Yoo, Y., Lehmann, J., Amsterdam, V., Chan, Y., Rothe, H., Berlin, F. U., Alpar, P., Fürstenau, D., & Wurm, B. (2021). Researching Digital Entrepreneurship: Current issues and suggestions for future directions. Communications of the Association for Information Systems, 48(1), 284–304. https://doi.org/10.17705/1cais.04833