

CHAPTER I

INTRODUCTION

This chapter contains the research background, problem formulation, research objectives, research benefits, problem limitations, and writing system.

1.1 Background

Small and Medium Enterprises (SMEs) in Indonesia include various small to medium-sized businesses that play a significant role in the national economy. Based on Law of the Republic of Indonesia Number 20 of 2008, SMEs are defined as small industries with certain limitations on assets and number of employees, as well as medium industries that are larger than small industries but have not yet reached the scale of large industries (Tambunan, 2023)

Small and Medium Industries (SMIs) refer to the production of goods used in everyday life, focusing on processing raw materials into value-added goods. SMIs is closely related to Small and Medium Enterprises (SMEs), which focus on marketing manufactured products. Based on Ministerial Regulation No. 64/M-IND/PER 7/2016, industry includes activities that process raw materials and utilize resources to produce value-added goods. The workforce in industry consists of permanent workers who receive regular salaries, while the investment value includes land, buildings, machinery, and equipment, but does not include working capital used in industrial activities. The following are the differences between micro, small, and medium industries **Table 1.1**. (Al Hanani & Rachmawati, 2022).

Small and Medium Industries (SMIs) are one of the main contributors to Indonesia's Gross Domestic Product (GDP). The manufacturing sector, including small industries, contributes significantly to GDP despite facing various challenges. In addition, this sector also plays an important role in employment and promoting sustainable economic growth (Kezia Laksmana Putri, 2022). Small industries play

an important role in supporting national and regional economic growth. This sector contributes significantly to the Gross Domestic Product (GDP) and provides extensive employment opportunities for the local community. In West Sumatra, small industries are one of the pillars of the economy that play a role in community development and the preservation of regional products. However, in the face of global competition and dynamic market changes, small industries need new strategies and approaches to remain relevant and competitive.

Table 1.1 Differences between Micro, Small, and Medium Industries

Criteria	Micro Industry	Small Industry	Medium Industry
Business Capital	≤ Rp1 billion	> Rp1 billion - Rp5 billion	> Rp5 billion - Rp10 billion
Number of Employees	< 5	5 - 19	20 - 99
Annual Turnover	≤ Rp2 billion	> Rp2 billion – Rp15 billion	> Rp15 billion - Rp50 billion
Capital	Very Limited	Limited, but better than micro	Medium, with easier access to capital
Management Structure	General	Basic, more structured	More complex and formal
Business Examples	Street vendors, home businesses	Small retail stores, workshops	Manufacturing companies, construction companies

Amidst the rapid pace of digitalization, Artificial Intelligence (AI) technology has emerged as a smart solution that can strengthen industrial competitiveness. Artificial Intelligence is the ability of computer systems that focus on developing systems or machines capable of mimicking human intelligence and behavior in performing tasks such as learning from data (machine learning), recognizing patterns, decision making, pattern recognition, prediction, process automation, and solving problems independently without direct human intervention. This technology has been widely used in various sectors to improve efficiency and productivity. In the small industry sector, for example, AI can be used to automate customer service through chatbots, compile financial reports automatically, and analyze market data to support faster and more efficient business decision-making (Putra Ganda Dewata, Azzar Rizky, 2024).

Artificial Intelligence (AI) has become one of the fundamental changes in various industries, including small and medium industries (SMIs). The application of AI in this sector can optimize various operational aspects, from production processes to customer service. Artificial Intelligence (AI) has great potential to increase the efficiency, productivity, and competitiveness of small industries. This technology enables the optimization of production processes, better market demand predictions, and more efficient resource management. Artificial intelligence actually has benefits that go beyond being just a technological trend; it is also a means of improving operational efficiency, enhancing data analysis, and providing more professional customer service. For example, AI-based chatbots can provide 24-hour customer support without increasing the number of staff. This is certainly very beneficial for small industries that have limited budgets for recruiting additional staff. In addition, AI can also help automate administrative tasks so that the production team can focus on more productive activities.

Although the benefits of AI are significant, the level of adoption in the small industry sector, especially in West Sumatra, is still low. This low level of adoption is due to several factors. The main challenges faced by small industries in integrating AI include limited trained human resources and inadequate technological infrastructure. Many small business owners find it difficult to understand and implement this advanced technology due to a lack of knowledge and skills. In addition, the high cost of implementing AI is also a barrier for many small industries to invest in this technology. In this context, it is important to realize that although AI offers many benefits, its successful adoption depends heavily on the organization's readiness to make changes.

In some regions of Indonesia, such as West Sumatra, access to technology and the internet is still limited. Inadequate infrastructure makes the adoption of modern technology more complex and expensive. Therefore, it is important to identify and overcome these obstacles so that all regions can optimally utilize the potential of AI. In addition to technical factors, socio-economic aspects also need

to be considered in the transition to the digital era, where changes in organizational behavior and work culture are challenges that must be faced by business actors.

Table 1.2 Number of Small Industries per District/City in West Sumatra

No	Regency/City	Number of Small Industries
1	Lima Puluh Kota	5
2	Pasaman	2
3	Pasaman Barat	2
4	Sawahlunto Sijunjung	8
5	Solok	17
6	Tanah Datar	1
7	Padang	27
8	Payakumbuh	3
Total		66

(Source: West Sumatra Industry and Trade Office, 2024)

Based on data from the West Sumatra Industry and Trade Office in 2024, there were 66 small industries in West Sumatra, as shown in **Table 1.2**. Small industries in West Sumatra face major challenges in improving their economic competitiveness compared to other regions, such as DKI Jakarta, which shows a significant difference in GDP and GDP per capita.

GDP per capita reflects the average income or economic well-being per person, rather than total economic output. Meanwhile, GDP measures the total size of the economy of a region. This describes the total value of all economic activities that occur in the area, both for local consumption and export.

Based on the data available in **Figure 1.1**, the per capita GRDP of West Sumatra in 2023 at constant prices (ADHK 2010) only reached Rp33.188 million. Meanwhile, DKI Jakarta recorded a much higher per capita GRDP at constant prices, namely Rp192.133 million. This difference reflects a significant disparity in economic capacity between the two regions (Badan Pusat Statistik, 2023).

Nilai PDRB/GRDP (juta rupiah/million rupiah)	2019	2020	2021 ¹	2022*	2023**
(1)	(2)	(3)	(4)	(5)	(6)
ADHB/at Current Price (juta rupiah million rupiah)	245.949.737,17	241.894.127,68	253.100.196,47	285.376.460,98	312.770.276,68
ADHK/at Constant Price (juta rupiah million rupiah)	172.205.571,30	169.426.614,10	174.999.891,95	182.629.142,51	191.071.350,94
PDRB Per Kapita/Per Capita GRDP ((ribu rupiah/thousand rupiah)					
ADHB/at Current Price	44.885,51	43.825,66	45.218,16	50.264,02	54.326,76
ADHK/at Consant Price	31.427,29	30.696,21	31.264,98	32.166,90	33.188,21
Pertumbuhan PDRB Per Kapita ADHK 2010 (persen) Growth Per Capita GDRP at 2010 Contant (percent)	3,14	-2,33	1,85	2,88	3,18
Jumlah Penduduk Population	5.479.491,00	5.519.463,00	5.597.313,00	5.677.549,00	5.757.205,00
Pertumbuhan Jumlah Penduduk (persen)/Population growth (percent)	1,81	0,73	1,41	1,43	1,40

Figure 1.1 GRDP and GRDP per capita of West Sumatra for 2019-2023
(Source: BPS, 2023)

The low per capita GRDP value in West Sumatra indicates that the economic competitiveness of this region still needs to be improved, including through the adoption of cutting-edge technologies such as Artificial Intelligence (AI). The adoption of AI has the potential to accelerate productivity gains, operational efficiency, and innovation in small industries, which can contribute to regional economic growth. However, with limited infrastructure and managerial capabilities, this challenge becomes even more complex for West Sumatra compared to more developed regions such as DKI Jakarta, as shown in **Figure 1.2**.

Rincian/ Description	2019	2020	2021	2022	2023
(1)	(2)	(3)	(4)	(5)	(6)
PDRB (Miliar Rp)/ GRDP (Billion Rp)					
1. ADHB/ at Current Prices	2.815.636	2.767.273	2.912.885	3.188.539	3.442.981
2. ADHK 2010/ at Constant Prices 2010	1.836.241	1.792.291	1.856.001	1.953.489	2.050.466
PDRB per Kapita (Ribu Rp)/ GRDP per Capita (Thousand Rp)					
1. ADHB/ at Current Prices	268.052	262.615	274.660	299.675	322.615
2. ADHK 2010/ at Constant Prices 2010	174.813	170.089	175.005	183.598	192.133
Pertumbuhan PDRB per Kapita ADHK 2010/ Growth of per Capita GRDP at Constant Prices 2010	5,46	-2,70	2,89	4,91	4,65
Jumlah Penduduk (Orang)/ Population (People)	10.504.057	10.537.371	10.605.437	10.640.007	10.672.100
Pertumbuhan Jumlah Penduduk (Persen)/ Population Growth (Percent)	0,90	0,35	0,65	0,33	0,30

Figure 1.2 DKI Jakarta's GDP and GDP per Capita in 2019-2023
(Source: BPS, 2023)

Strategic management also plays a central role in this adaptation process. A

well-thought-out strategic plan is needed to anticipate the positive and negative impacts of AI implementation. Questions such as whether the plan is good enough or needs to be revised should always be on the minds of small business leaders. This relates to how existing resources can be optimally used to create a flexible work environment that is responsive to rapid changes in the digital world.

However, internal strategies alone are not enough if they are not balanced with external conditions, especially the readiness of the community to interact with digital technology. For this reason, IMDI is presented as a measuring tool that can provide an overview of the strengths and weaknesses of Indonesian society in the digital era, which ultimately also affects the success of AI implementation in small industries.

The *Indeks Masyarakat Digital Indonesia* (IMDI) is a crucial tool for measuring the community's ability to use digital technology in everyday life. IMDI can identify the strengths and weaknesses of Indonesian society in facing the rapidly developing digital era. This can be seen in the IMDI distribution values in Indonesia in **Figure 1.3**. Increased internet access, a variety of digital services, and accelerated digitalization due to the COVID-19 pandemic have changed the social and economic order. Even so, there are still digital gaps that need to be addressed, especially in remote areas and certain community groups (IMDI, 2025).

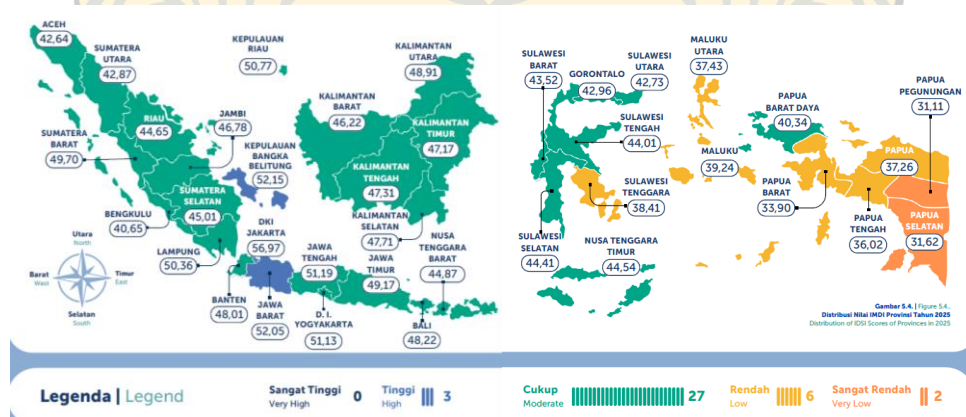


Figure 1.3 Distribution of IMDI (*Indeks Masyarakat Digital Indonesia*) Scores by Province in 2025
(Source: IMDI, 2025)

In facing these challenges, a dynamic capability-based approach becomes highly relevant. This approach focuses not only on current readiness, but also on the ability to continuously improve capabilities in line with future needs. A systematic evaluation of technological readiness is essential to ensure that no gaps are overlooked in the migration process towards the digital era. With this approach, small industries can be better prepared to face market changes and take advantage of the opportunities offered by AI technology.

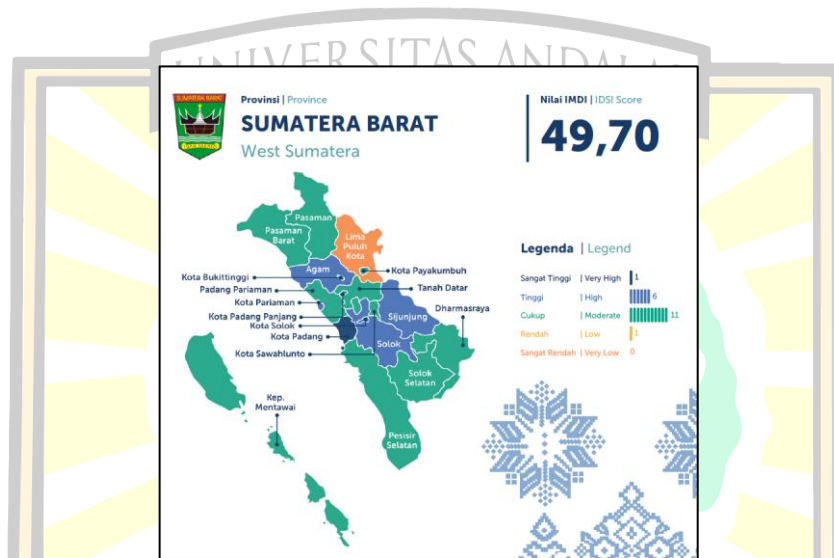


Figure 1.4 Distribution of IMDI (*Indeks Masyarakat Digital Indonesia*) Scores for West Sumatera in 2025
(Source: IMDI, 2025)

Based on **Figure 1.4**, the *Indeks Masyarakat Digital Indonesia* (IMDI) of West Sumatra Province in 2025 is recorded at 49.70, which is included in the moderate category. This value shows that the level of readiness and utilization of digital technology by the community is already at a medium level, but there is still room for improvement. Most districts/cities in West Sumatra are in the sufficient category, which indicates that access, digital skills, and the use of technology have begun to be evenly distributed. However, there are still areas that are in the low category, thus showing the existence of a digital gap between regions. In general, this condition indicates that digital transformation in West Sumatra has developed, but it still needs to be strengthened in terms of digital infrastructure, technological literacy, and the use of digital services in order to reach a higher category.

In today's digital era, several industries have utilized digital technology to improve their operational efficiency and effectiveness. One of the most widely used digital technologies is social media and websites. By utilizing social media and websites, industries can reach a wider audience and open up opportunities for accelerated growth.

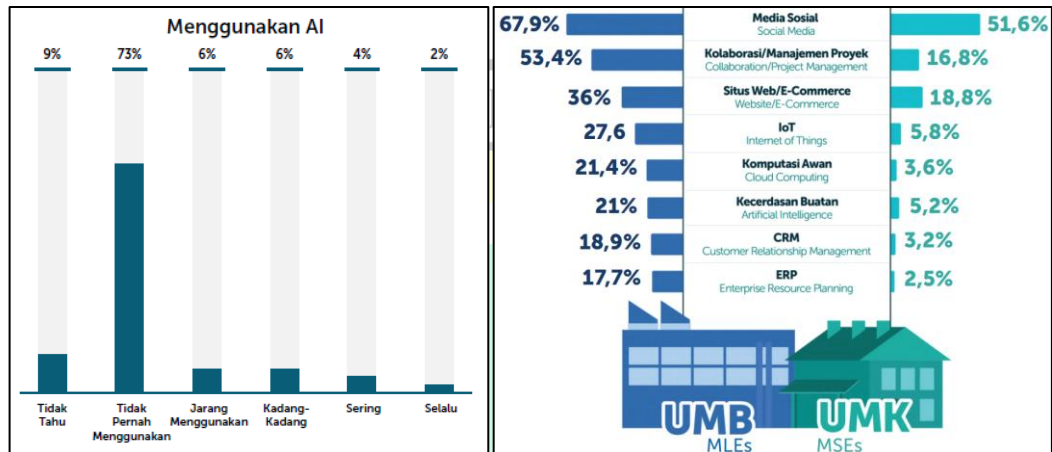


Figure 1.5 Frequency of AI Use in Industry in 2024 and 2025
(Source: IMDI, 2024 and IMDI, 2025)

However, as shown in **Figure 1.5**, based on AI usage data in the industry in 2024, more than 70% of industries still do not utilize Artificial Intelligence (AI) technology. In fact, the application of AI, such as chatbots and virtual assistants, can increase operational effectiveness and simplify customer relationship management. By integrating this technology, industries can respond more efficiently to customer needs while optimizing their business processes (IMDI, 2025).

This situation shows a significant gap between the potential benefits of AI and the actual level of readiness in the field, especially in the small industry sector. Many businesses do not yet have a sufficient understanding of how AI can be applied practically according to their business capacity and needs. In addition, there are no tools available that can systematically map the extent of their readiness to adopt this technology. Therefore, a more systematic and targeted approach is needed to increase AI adoption readiness in West Sumatra. This effort aims to help small industries adapt to technological developments and gradually catch up

economically with more advanced regions.

Therefore, this study aims to help small industries in West Sumatra improve their readiness to adopt Artificial Intelligence (AI) by examining the role of dynamic capabilities and by developing an AI Adoption Readiness Index. With this model, it is hoped that business actors will find it easier to understand the steps that need to be taken to integrate AI into their operations. In addition, the results of this study are expected to serve as a reference for other stakeholders, such as the government and educational institutions, in designing more specific and effective support programs for the capacity development of small industries in Indonesia.

Overall, this research aims not only to improve the operational efficiency of small industries but also to ensure that they can compete effectively in an increasingly competitive and complex digital era. By understanding the challenges and potential that exist, an environment that supports the growth of small industries through the adoption of modern technologies such as AI can be created. Thus, the high hope that small industries will be able to adapt to the changing times and take advantage of new opportunities will be realized. However, as shown in Figure 1.4, based on data on AI usage in industry in 2024, more than 70% of industries are still not utilizing Artificial Intelligence (AI) technology. In fact, the application of AI, such as chatbots and virtual assistants, can increase operational effectiveness and facilitate customer relationship management. By integrating this technology, industries can be more efficient in responding to customer needs while optimizing their business processes (IMDI, 2025).

This situation indicates a significant gap between the potential benefits of Artificial Intelligence (AI) and the actual level of readiness in the field, particularly within the small industry sector. Many business actors still lack sufficient understanding of how AI can be applied practically in accordance with their business capacity and operational needs. In addition, there are currently limited systematic tools that can be used to assess and map the level of readiness of small industries in adopting AI technologies. Therefore, a more systematic and targeted

approach is needed to improve AI adoption readiness in West Sumatra, particularly through the development of a dynamic capability model and the formulation of an AI Adoption Readiness Index. This approach is expected to provide a clearer understanding of the internal conditions that support or hinder the adoption of AI technologies in small industries.

Therefore, this study aims to help small industries in West Sumatra improve their readiness to adopt AI by analyzing the role of dynamic capabilities and by developing an AI Adoption Readiness Index. Through this model, business actors are expected to better understand the key factors that influence their readiness to integrate AI into their business processes. In addition, the results of this study are expected to serve as a reference for other stakeholders, such as government institutions and educational organizations, in designing more targeted and effective programs to support the digital capacity development of small industries in Indonesia.

Overall, this research aims to contribute to strengthening the competitiveness of small industries by identifying the factors that influence their readiness to adopt AI technologies. By understanding both the challenges and opportunities associated with AI adoption, it is expected that small industries will be better prepared to adapt to technological changes and take advantage of new opportunities in an increasingly digital and competitive economic environment.

1.2 Problem Formulation

Based on the background of these issues, the research questions in this study are as follows.

1. What factors influence dynamic capabilities (sensing, seizing, and transforming) in small industries in West Sumatra in adopting Artificial Intelligence?

2. How can the Dynamic Capabilities Model help small industries improve their readiness to adapt to AI technology?

1.3 Research Objectives

Based on the problems formulated by the researcher, the objectives of this study are as follows.

1. To identify the factors that influence dynamic capabilities (sensing, seizing, and transforming) in small industries in West Sumatra in adopting Artificial Intelligence.
2. To determine how the Dynamic Capability Model can help small industries improve their readiness to adapt to AI technology.

1.4 Research Benefits

The benefits of the research from the theoretical and practical side are as follows.

1.4.1 Theoretical Benefits:

1. This research enriches the digital transformation literature by presenting a quantitative index of AI adoption readiness relevant to the context of small industries.
2. This study provides new empirical evidence of the Dynamic Capabilities View framework in the context of AI adoption in small businesses.

1.4.2 Practical Benefits:

1. For small industry owners, it can provide a simple and free diagnostic tool to assess the readiness of AI adoption as well as be an initial roadmap for digital transformation.
2. For the Government/Institution, it can provide empirical data on the readiness of West Sumatra's small industries as the basis for the formulation of targeted digitalization programs and policies.
3. For academics, it can produce tested research models and instruments that can be replicated or adapted for similar research in other provinces or in different industrial sectors.

1.5 Research Limitations

There are limitations to the problem in this study, which are as follows.

1. The object of the research is limited to small industries operating in the West Sumatra Province area.
2. Data is collected from one key respondent in each small industry i.e. owners or managers.
3. The focus is on assessing internal readiness in adopting AI.

1.6 Outline of Report

The writing systematics that will be used in this study consists of:

BAB I INTRODUCTION

This chapter contains the research background, problem formulation, research objectives, problem limitations and writing systematics.

BAB II LITERATURE REVIEW

This chapter contains the theories and methods used in this study. In this case, the theories that will be described are Artificial Intelligence (AI) in Small Industries, dynamic capabilities in Small Industries, technology adoption and AI in Small Industries, and Structural Equation Modeling (SEM).

BAB III RESEARCH METHODOLOGY

This chapter contains the stages that are carried out in the systematic completion of the final project. The research stages consist of introduction, problem formulation, literature study, problem-solving methodology, and drawing conclusions and suggestions.

BAB IV RESEARCH AND DISCUSSION

This chapter explains the process of data collection and processing carried out in research. This chapter also describes the analysis of SEM-PLS used as a data processing method. Furthermore, an analysis was carried out on the results of data processing that had been carried out.

BAB V CONCLUSIONS AND RECOMMENDATIONS

This chapter contains conclusions from the research that has been carried out and recommendations for further research.