

CHAPTER 1. INTRODUCTION

1.1 Project Background

One is the formation of the pricing strategies of products and service. The contemporary business model that is being experienced has a fundamental change as a result of the presence of several AI innovations. Using an AI-powered dynamic pricing system, by taking into account different determining factors, the companies can adjust price automatically. At the same time, such as changes in demand and competitor prices and production costs strategies, consumer behavior and habits. This system is not only used in estimating price levels but also has a strategic role in assisting in complex price decision-making in real-time in an increasingly competitive digital market. The ability of artificial intelligence-based dynamic pricing mechanisms to respond adaptively to changes in demand, competitive pressures and consumer behavior has been proven through various empirical studies. Thus, organizations can optimize revenue generation and increase overall profitability (Nowak & Pawłowska-Nowak, 2024; S. Vimaladevi, 2024).

In the context of the global digital economy, the pricing process takes place at a much higher speed than in traditional markets. This acceleration is primarily due to AI technology's ability to simultaneously process and integrate large amounts of internal and external data, such as cost structures, competitor prices, and demand patterns, to determine optimal pricing outcomes. Previous studies related to dynamic pricing in the e-commerce space indicate that machine learning-based pricing systems are very accurate in aligning prices in real-time based on the existing market situation, based on the core target of optimizing revenue and maintaining a competitive advantage (Pradhan et al., 2025).

However, Micro, Small and Medium Enterprises (MSMEs) in Indonesia always encounter various obstacles in selecting pricing decisions. Many MSMEs still choose a conventional pricing approach, which generally calculates selling prices by including a fixed margin to production funds, without being structured to include competitor prices or real-time market requirements. As a result, when the internal budget increases while competitors' prices remain normal or decrease,

many MSMEs experience reduced profit margins, which ultimately undermines their competitiveness and long-term sustainability. Such events underscore the limitations of manual pricing strategies in such a dynamic digital marketplace (Vashishtha et al., 2024).

This situation indicates that there is a significant gap in studies and great potential for innovation, especially for the expansion of AI-motivated pricing systems that are aligned with the operational realities of MSMEs in Southeast Asia, with a core orientation towards Indonesia. Various MSMEs are hampered by the lack of technological resources and fragmented data infrastructure, as well as the lack of automatic mechanisms capable of dynamically integrating internal cost information with competitor price data. Studies conducted regarding dynamic pricing indicate that AI prepares a series of adaptive works to maximize pricing decisions by always combining various market variables in real-time (Awais, 2024).

So, this study focuses on 3 core variables: internal costs, competitor prices, and AI-based price recommendations. Internal cost variables include cost of goods sold (COGS), packaging costs, target profit margin, as well as the platform administration budget. Competitor prices represent external market conditions, while an AI-based recommendation system acts as an integrative mechanism that combines internal and external data to obtain maximum price recommendations. The theoretical basis of this study is based on dynamic pricing theory and a data-driven decision-making framework, which focuses on the core functions of empirical and analytical intelligence in the formulation of current business strategies (Nowak & Pawłowska-Nowak, 2024).

Using a quantitative Research and Development (R&D) approach, this study aims to design, develop and evaluate an AI-based Price Recommendation System that integrates internal cost data with competitor price information. This study focuses on Micro, Small and Medium Enterprises (MSMEs) in Indonesia operating on the Shopee e-commerce platform, which represents one of the largest and most competitive online markets in this country. The recommended system is evaluated

empirically to assess its effectiveness in increasing price accuracy, profitability and competitive position for Shopee-based MSMEs.

Therefore, the current lack of manual pricing practices highlights the need for a more structured and adaptive approach to pricing for MSMEs. In contrast to pricing procedures that rely on fixed margins and subjective estimates, this study suggests the development of an AI-motivated product pricing recommendation system that integrates internal cost elements with competitor price information. The developed system is intended to be a decision support system which can be capable of providing market flavored and flexible recommendation of data-based prices. Through this, the approach seeks to address the shortcomings of the existing pricing mechanism and encourage MSMEs to make more informed, competitive and sustainable price decisions in a market characterized by dynamic competition in the digital market through a connection between the internal financial calculations and external competitive dynamics.

1.2 Problem Statement

MSMEs always encounter various obstacles in setting appropriate and competitive product prices. The dominant attachment to manual pricing strategies and initial markup calculations often leads to inconsistent pricing decisions, which can later threaten profit margins and reduce the industry's comprehensive competitiveness in the market.

A large number of MSMEs in Indonesia continue to choose traditional and manual pricing practices that do not structurdly include internal cost structures or competitor pricing, thus causing price instability and minimal profitability. The application of analytical pricing techniques and AI is minimal due to lack of resources, insufficient digital infrastructure, and insufficient technical skills. In addition, empirical studies regarding AI-based pricing recommendation systems that are able to integrate internal financial data and market information remain rare in the MSME sector in Indonesia, highlighting the urgent need for specially designed technology solutions to enable adaptive, data-driven and competitive pricing strategies for small-scale businesses (Alfaiza et al., 2025; Kgomo &

Lavhengwa, 2025; M et al., 2025).

To address this gap in studies, this study aims to improve an AI-based price recommendation system that is able to analyze internal cost data and competitor price data simultaneously in order to obtain appropriate price recommendations. It is hoped that this kind of approach will increase and strengthen MSME profit margins their competitive advantage in an increasingly dynamic and digitized market environment.

Comprehensively, the initial discussion underscored the major disparities in pricing practices among Indonesian MSMEs, primarily due to the persistence of manual pricing methods that do not structurally integrate internal cost structures with competitor price dynamics. Although previous studies have examined various AI-motivated pricing models, the attention paid tends to be on improving pricing recommendation systems that simultaneously combine internal cost data and external market pricing in the specific operational scope of MSMEs. According to this gap, the problem formulation in this study is:

1. To what extent can the relationship between internal cost components and competitor pricing be identified and analyzed in relation to the profit margins of MSMEs in Indonesia?
2. How can an AI-based dynamic pricing recommendation model be designed to systematically integrate internal cost data and competitor pricing information to generate optimal and adaptive pricing recommendations for MSMEs?
3. What is the impact of the proposed AI-based pricing recommendation system on the profit margins, competitiveness, and decision-making accuracy of MSMEs in Indonesia?

1.3 Project Objectives

The core purpose of this study is "Development of an AI-Based Product Pricing Recommendation System by Considering Internal Costs and Competitor Prices for MSMEs." This is to design and evaluate an intelligent pricing recommendation system that is able to obtain maximum prices from dynamic

integration of internal cost structures and competitor price data. This study aims to encourage MSMEs to develop profitability, strengthen their competitive position, and increase the accuracy and consistency of decision-making steps regarding prices.

So, the specific purpose of this study is:

1. To identify the relationship between internal cost components and competitor pricing, as well as their combined influence on the profit margins of MSMEs in Indonesia.
2. To develop an AI-based dynamic pricing recommendation model that systematically integrates internal cost data and competitor pricing information to generate optimal and adaptive pricing recommendations for MSMEs.
3. To evaluate the effectiveness and performance of the proposed AI-based pricing recommendation system in enhancing profit margins, improving competitiveness, and increasing decision-making accuracy among MSMEs within the Indonesian market context.

1.4 Project Scope

1) Project

a. Internal Cost Data and MSMEs Competitor Prices :

The system can collect and use data regarding internal funds such as cost of goods sold (COGS), product packaging costs, targeted profit margins, as well as platform administration funds as well as competitor price information obtained from MSMEs. This data collection is useful as important advice for price analysis.

b. Development of an AI-Based Price Recommendation Model :

This system applies a machine learning algorithm designed to process internal funding data and competitor price information in order to obtain adaptive and effective price suggestions. This step includes training the model from historical data sets, analyzing key price variables, and assessing the accuracy and consistency of forecasted price output.

c. Evaluation of System Effectiveness :

After upgrading the model, the system can undergo empirical testing to evaluate the accuracy of price recommendations and their impact on MSME profit margins and competitive performance. This evaluation may take place conducted under the real operational conditions of the participating MSMEs to ensure practical relevance and applicability.

2) User

a. MSME Owners :

MSME owners and managers are the core users of the system. They can immediately apply the price recommendations obtained to trigger routine business decision-making stages, especially to determine appropriate and competitive product prices.

b. Researchers and Developers :

Researchers and system developers represent secondary users. Their role includes testing, refining, and validating the performance of AI models, as well as assessing the accuracy, superiority, and practical relevance of the price suggestions the system obtains.

3) System

a. User Interface :

This system provides an intuitive and user-friendly interface that allows MSMEs to input internal cost data and competitor price information. This aspect also produces automatic price suggestions and provides comparative analysis of competitor prices to facilitate decision making.

b. Analysis and Prediction Process :

The system carries out data analysis and produces accurate price estimates from AI-motivated computing strategies. This step integrates internal budget variables with competitor pricing data to trigger an adaptive and responsive pricing strategy.

c. Price Recommendation Output :

The system produces appropriate price suggestions accompanied by comparative price analysis of competitors. The output is addressed exclusively at pricing optimization and does not incorporate additional functionalities such as inventory management or consumer behavior analytics.

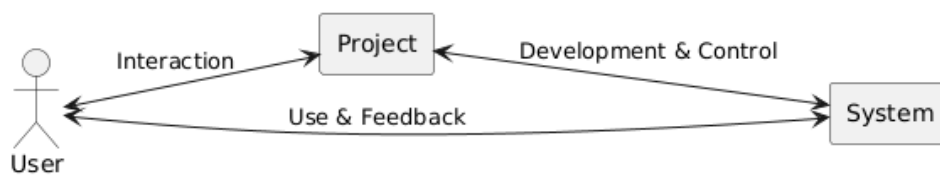


Figure 1.1 Diagram of Project Scope

1.5 Project Significance

This study generates great academic relevance because it contributes to the available literature regarding the digital economy and AI-based recommendation systems. Although a large number of previous studies examined the application of dynamic pricing in large-scale e-commerce companies, these studies specifically focused on MSMEs, especially those that integrate internal funding structures and competitor pricing into AI-motivated pricing recommendation models, are still minimal. Therefore, this study develops understanding regarding the adoption of AI technology in low-resource environments and offers new knowledge regarding the obstacles to expanding AI solutions that are appropriate and contextually relevant for small businesses.

Based on practical aspects, this study produces real benefits for Indonesian MSMEs by developing accuracy, efficiency and responsiveness at the selection stage of price decision decisions. The AI-based price recommendation system expanded in this study has the potential for MSMEs to analyze internal funds in a structured manner against competitors' prices, resulting in flexible price suggestions that adapt to ever-advancing market conditions. This role ensures maintenance of profit margins, strengthens competitive positions, and instills business strength in price-sensitive and volatile markets.

Strategically, this study is in line with Indonesia's national digital transformation program and government initiatives aimed at developing the results and competitive strength of MSMEs from data-driven technological interventions. The advancement of AI-based pricing recommendation systems plays a role in creating a digital economic ecosystem that is increasingly inclusive, sustainable and reliable. Apart from that, prioritizing technological innovation and developing MSME business methods that are able to adapt to market fluctuations.

Comprehensively, this study produces significant theoretical and practical value by producing an innovative model that can be directly applied to trigger smarter, more efficient and adaptive pricing decisions, which will later aim to develop the profitability and competitive strength of MSMEs.

1.6 Chapter Summary

This study examines the improvement of a product price recommendation system using Artificial Intelligence (AI) which is specifically designed to stimulate Indonesian MSMEs. This background indicates that a large number of MSMEs choose manual pricing steps or makeshift markup strategies, which often cause price abnormalities, reduced profit margins, and lack of market competitiveness. Although previous studies highlight the need for internal funding and competitive conditions in pricing, the integration of these two factors from AI remains rare, especially in the MSME space.

This study aims at 3 core targets: examining the correlation of internal cost components and competitor prices in forming MSME profit margins, developing an artificial intelligence-based pricing recommendation model that systematically integrates all these factors, and evaluating the effectiveness of the proposed system in increasing the profitability and competitive position of MSMEs. This study chooses a quantitative Research and Development (R&D) approach, which includes collecting data on internal costs and competitor prices, design and implementation of AI-based algorithms, as well as empirical testing and evaluation in real MSME operational conditions. Apart from that, this system is accompanied by a user-friendly interface, enabling MSME owners and managers to obtain price

suggestions that are adaptive, data-driven, and maximally efficient in making correct price decisions.

The need for this study has been tested by various assessments. According to academics, this aspect plays a role in the digital economy literature and the application of AI in MSMEs by integrating internal funding systems and competitor prices into AI-motivated recommendation models. In practical terms, this system is expected to be able to develop accuracy, ability to integrate and responsiveness in selecting MSME pricing decisions. Strategically, this study is in line with Indonesia's national digital transformation program by triggering a digital economic ecosystem that is increasingly inclusive, sustainable and reliable. Apart from that, it produces innovative and applicable models that have the opportunity to increase the profitability of MSMEs and strengthen their competitive advantages in dynamic market conditions.