

# Analysis of Entrepreneurship-Based Human Resource Management Integration to Improve Business Ecosystem Sustainability in a Dynamic Market Era: A Study in Magelang Regency

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## Abstract

The increasingly dynamic business environment requires business actors, especially MSMEs, to adapt quickly and strategically to remain sustainable. Human resource management that is not only administrative but also oriented towards entrepreneurial values is believed to be the key to strengthening competitiveness in an era of rapidly changing markets. This study aims to analyse the effect of entrepreneurial human resource management integration on business ecosystem sustainability, with the dynamic market era as a mediating variable. This study employs an explanatory quantitative approach to examine MSMEs in Magelang Regency, Central Java. The study population consists of all active MSME actors, and through the proportionate stratified random sampling method, 71 respondents were obtained as the study sample. Primary data were collected using a Likert scale questionnaire and analysed using Partial Least Squares-Structural Equation Modelling (PLS-SEM) with SmartPLS version 4.0. The results show that integrating entrepreneurial human resource management has a positive effect on market adaptability, which significantly improves the sustainability of the business ecosystem. Furthermore, the dynamic market era was found to mediate the relationship between entrepreneurial human resource management and business sustainability. This confirms that successful innovative human resource management must be accompanied by the ability to cope with changes in the external environment. These findings have important implications for strengthening MSME development strategies based on human capabilities and sustainable market adaptation.

**Keywords:** Integration of Entrepreneurial-Based Human Resource Management, Dynamic Market Era, Business Ecosystem Sustainability, SMEs, Magelang Regency.

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## INTRODUCTION

Micro, small, and medium enterprises (MSMEs) are the main pillars of the national economy, contributing significantly to job creation, economic equality, and gross domestic product (GDP) growth. However, amid accelerating globalisation and digital transformation, MSMEs face increasingly complex challenges in their business environments. Changes in consumer behaviour, technological disruption, and increased competition require businesses to be highly adaptable, innovative, and long-term oriented (Campos-García et al., 2024). In this context, business sustainability depends not only on external factors such as government policies or market conditions, but also on internal factors, particularly the ability of human resource management (HRM) to adopt entrepreneurial and innovative values (Cooke, 2023; Sakib et al., 2025). Therefore, research on the integration of entrepreneurship-based HRM is

highly relevant and urgent, given the need for MSMEs to strengthen their competitiveness and business resilience in a dynamic market era.

Magelang Regency was chosen as the object of this study because this region has unique characteristics, a high density of MSMEs, and an important role in supporting the regional economy. Based on data from the Magelang Regency Statistics Agency (2023), there are more than 30,000 active business units, the majority of which are engaged in the trade, culinary, and creative industries. However, most MSMEs are still managed conventionally, relying on family labour, and have low levels of innovation. Unlike MSMEs in big cities such as Yogyakarta or Semarang, which have adopted digital and innovative management, MSMEs in Magelang Regency face limitations in terms of human resource capacity and the systematic application of entrepreneurial principles. This condition makes Magelang Regency an interesting and relevant research context for analysing how the integration of entrepreneurship-based human resource management can be a catalyst for the sustainability of the local business ecosystem.

Conceptually, this study focuses on three main variables, namely Entrepreneurship-Based Human Resource Management Integration as the independent variable (X), Dynamic Market Era as the mediating variable (Z), and Business Ecosystem Sustainability as the dependent variable (Y). These three variables are rooted in Stakeholder Theory (Freeman, 1984), which asserts that organisational success is determined by its ability to manage relationships with stakeholders through innovation, collaboration, and adaptation to environmental changes (Donaldson & Preston, 1995). The integration of entrepreneurship-based HR management plays a role in creating a proactive and creative orientation within the organisation, which in turn strengthens its dynamic capabilities to respond to market changes (Al-Abbadī & Abu Rumman, 2023). Meanwhile, an organisation's ability to adapt to a dynamic market contributes directly to the sustainability of the business ecosystem, in economic, social, and environmental dimensions (Correggi et al., 2024; Chatterjee, 2022).

Previous studies have shown that HRM practices and entrepreneurial orientation play a crucial role in sustainable performance. However, the relationship between these two factors and business sustainability, through the mechanisms of market dynamics, has not been comprehensively studied. For example, the research by Campos-García et al. (2024) emphasises the importance of HRM in bridging organisational sustainability. However, it does not highlight the role of HR entrepreneurship as a key driving factor.

### Human Resource Management (HRM)

Human resource management (HRM) is a strategic system designed to manage individuals within an organisation so that their potential contributes optimally to the achievement of long-term goals. This concept has shifted from a mere administrative function to Strategic Human Resource Management (SHRM), which emphasises the alignment between HR practices and organisational strategy (Jackson, Schuler, & Jiang, 2014). SHRM views people as irreplaceable assets that serve as a source of sustainable competitive advantage (Barney, 1991). In the context of an increasingly dynamic modern business environment, HRM practices are no longer solely focused on efficiency but also on value creation through the development of adaptive, innovative, and collaborative capabilities (Yu et al., 2022). Research by Yu et al. (2022) shows that the strength of the Human Resource Management System (clarity, consistency, and support of the HR system) plays an important role in maintaining

organisational sustainability when facing a crisis. Similarly, Rogoza and Maj (2023) emphasise that effective HR strategies can strengthen a company's competitiveness through increased employee engagement and continuous innovation.

In the context of MSMEs, the implementation of strategic HR management is often not optimal due to limited resources and managerial capacity. In fact, well-managed HR can increase productivity, strengthen innovation, and become the foundation for creating an organisation that is resilient to change (Kashive et al., 2023). Therefore, this study views the integration of entrepreneurship-based HR management as a strategic approach to increase HR added value while promoting business sustainability.

### Entrepreneurship and Entrepreneurial Orientation

Entrepreneurship reflects the ability of individuals or organisations to identify opportunities, take risks, and create valuable innovations. Conceptually, entrepreneurial orientation (EO) encompasses three main dimensions, namely innovation, proactivity, and risk-taking (Rauch et al., 2009). In the context of modern organisations, EO is not only a performance factor but also a key driver in the formation of adaptive strategies to market uncertainty (Covin & Wales, 2022). Recent research shows that the integration of Strategic HRM and Entrepreneurial Orientation can produce resilient and innovative organisations. Kusa, Sudolska, and Witek (2024) found that adaptive and learning-oriented HR practices reinforce the positive effects of entrepreneurial orientation on organisational performance. Strategic HR creates a climate that encourages idea exploration, risk-taking, and continuous learning. Research by Nguyen and Luu (2023) highlights that entrepreneurial competency-based HR practices strengthen the competitiveness of SMEs in rapidly changing markets. These practices enhance innovative capabilities and the courage to make strategic decisions. Thus, in the context of this study, the integration of HR management and entrepreneurship is defined as the synergy between HR policies and entrepreneurial values that foster innovative, proactive, and adaptive behaviour within the organisation.

### Dynamic Market Era

The dynamic market era describes a business environment characterised by high uncertainty, rapid technological change, and consumer demand volatility. This concept is closely related to the Dynamic Capabilities Theory developed by Teece, Pisano, and Shuen (1997), which emphasises the importance of organisational capabilities in sensing, seizing, and transforming internal resources to remain competitive. Recent research by Correggi, Rancati, and Bastianoni (2024) concludes that organisations capable of adapting to market dynamics will be more successful in building long-term sustainability. They found that dynamic capabilities are an important mechanism that bridges the influence of innovation and resource management on sustainable performance. Meanwhile, Khan and Anwar (2023) show that in the context of MSMEs, the ability to adapt to market dynamics is a key differentiating factor between businesses that stagnate and those that grow amid competitive pressures.

From an HRM perspective, the era of dynamic markets demands flexible, fast, and learning-based management systems. Research by Arshad et al. (2022) confirms that organisations with agile HR systems can respond to external changes more effectively, increase innovation, and strengthen their competitive position. Therefore, in this study, the Dynamic Market Era (Z) is viewed as a mediating variable that bridges the relationship

between Entrepreneurial-Based HRM Integration (X) and Business Ecosystem Sustainability (Y), as market dynamics become the real arena where HR and innovation are tested.

### Business Ecosystem Sustainability

Business ecosystem sustainability encompasses an organisation's ability to survive and thrive in the long term by balancing economic, social, and environmental aspects (Elkington, 1997). The concept of Business Ecosystem Sustainability has evolved alongside growing global awareness of the importance of the Triple Bottom Line and stakeholder engagement in creating shared value. Recent empirical studies show a close relationship between HRM practices, entrepreneurial orientation, and sustainability. For example, research by Bansal, Jiang, and Jung (2023) confirms that organisational sustainability is highly dependent on the internal ability to integrate innovation and social responsibility into business strategies. Similarly, research by Nurlina et al. (2024) in the manufacturing sector shows that the combination of entrepreneurial orientation and sustainable HR practices contributes significantly to improving a company's environmental and social performance. In the context of MSMEs, the sustainability of the business ecosystem depends not only on profitability but also on collaboration with local stakeholders, the adoption of green technology, and the ability to build resilient business networks (Li et al., 2023). Thus, the Business Ecosystem Sustainability (Y) variable in this study is defined as the result of MSMEs' success in integrating economic, social, and environmental dimensions into their business systems through the support of entrepreneurial-oriented human resources and the ability to adapt to market dynamics.

### Conceptual Framework and Research Hypotheses

Based on the results of the literature review above, it can be concluded that integrating entrepreneurship-based human resource management (X) influences the adaptive capacity of organisations in facing market changes (Z), which in turn positively impacts the sustainability of the business ecosystem (Y). The era of dynamic markets (Z) is hypothesised to act as a mediator that bridges this relationship.

Based on this framework, the proposed hypothesis is:

*H1: Entrepreneurial-based HRM integration has a positive effect on the dynamic market era.*

*H2: The Dynamic Market Era has a positive effect on Business Ecosystem Sustainability.*

*H3: The Dynamic Market Era mediates the effect of Entrepreneurial-Based Human Resource Management Integration on Business Ecosystem Sustainability.*

## RESEARCH METHODOLOGY

This study employs a quantitative approach with explanatory research to elucidate the causal relationship between the independent variable (Entrepreneurship-Based Human Resource Management Integration), the mediating variable (Dynamic Market Era), and the dependent variable (Business Ecosystem Sustainability). The quantitative approach allows for objective measurement of social phenomena through the analysis of numerical data processed using statistical tools (Creswell & Creswell, 2018). The explanatory method was chosen because this study not only describes the empirical conditions of MSMEs but also tests the structural model formulated in the conceptual framework. Thus, the research results are expected to provide an in-depth understanding of the direct and indirect effects between

variables and prove the mediating role of the Dynamic Market Era in the relationship between entrepreneurship-based HRM integration and business ecosystem sustainability.

### Research Location and Time

This research was conducted in Magelang Regency, Central Java Province, which has a high concentration of MSME actors in various sectors, especially trade, culinary, and creative industries. The selection of this location was based on its great economic potential, but it still faces challenges in human resource management and the integrated application of entrepreneurial values (BPS Magelang Regency, 2023). The research was conducted from June to September 2025, covering the stages of instrument preparation, questionnaire distribution, field data collection, and data analysis using SmartPLS version 4.0 software.

### Research Population and Sample

The population in this study was all active MSME actors in Magelang Regency who were registered with the local Cooperative and MSME Office. Based on data from BPS Magelang Regency (2023), the number of active business units reached approximately 30,000, spread across 21 sub-districts with a variety of economic sectors. However, considering the accessibility of the research location and the effectiveness of field data collection, 71 MSME actors were successfully interviewed and completed the questionnaire. This number meets the minimum criteria for Partial Least Squares Structural Equation Modelling (PLS-SEM) analysis, which, according to Hair et al. (2021), can be conducted with a sample of 30–100 respondents, depending on the complexity of the model and the number of indicators.

The sampling technique used was purposive sampling, with the following criteria:

1. Business actors who have been actively running MSMEs for at least two years,
2. Directly involved in business management (owner/manager/administrator), and
3. Willing to complete the questionnaire in full.

This technique was chosen because it aligns with the research objectives, which require informants with a deep understanding of HR management practices and business strategies at the trim business unit level (Etikan & Bala, 2017).

### Types and Sources of Data

This study utilised two types of data, namely primary data and secondary data.

1. Primary data was obtained through the distribution of a closed questionnaire with a 1–5 Likert scale to 71 MSME respondents. The questionnaire was compiled based on theoretical indicators from tested academic literature (Hair et al., 2021).
2. Secondary data was obtained from official reports such as the Magelang Regency Central Statistics Agency (BPS) (2023), the annual report of the Cooperative and MSME Office, and previous research findings relevant to HRM, entrepreneurship, and micro-business sustainability.

Primary data was used to test the empirical model using the Partial Least Squares Structural Equation Modelling (PLS-SEM) method. In contrast, secondary data was used to strengthen the context and external validation of the research results.

### Research Instruments

The research instrument consists of a **structured questionnaire** comprising three main sections:

- 1) Part A: Respondent profile (age, education, length of business, type of business, business location).
- 2) Section B: Statements regarding the Entrepreneurial-Based Human Resource Management Integration variable (X).
- 3) Part C: Statements related to the Dynamic Market Era (Z) and Business Ecosystem Sustainability (Y).

All items are measured using a 1–5 Likert scale (1 = strongly disagree, 5 = strongly agree). The instrument was adapted from previous research with modifications appropriate to the local MSME context:

- 1) Entrepreneurship-Based Human Resource Management Integration (X) was adapted from Kusa et al. (2024) and Nguyen & Luu (2023), covering entrepreneurship training, innovation-based rewards, employee involvement in business ideas, and organisational flexibility.
- 2) Dynamic Market Era (Z) adapted from Khan & Anwar (2023), covering changing consumer needs, competition intensity, and the speed of technological change.
- 3) Business Ecosystem Sustainability (Y) is adapted from Li et al. (2023) and Bansal et al. (2023), covering economic dimensions (financial resilience), social dimensions (collaboration and social responsibility), and environmental dimensions (environmentally friendly practices).

Before distribution, the questionnaire was tested through a pilot test on 10 MSME respondents outside the main sample to ensure the instrument's clarity, relevance, and reliability (Hair et al., 2021).

#### Data Collection Techniques

Data was collected through two methods:

1. Online distribution using Google Forms, and
2. Direct field surveys through enumerators at the Magelang Regency SME centre.

Each respondent was informed about the purpose of the study and assured of the confidentiality of their answers. Data collection was conducted over four weeks, and incomplete or biased data were eliminated from the analysis.

Of the 80 questionnaires distributed, 71 were deemed valid and suitable for processing. This is in line with the minimum response rate standard of 70% in social research using survey methods (Bryman, 2016).

#### Data Analysis Technique

Data analysis was performed using the Structural Equation Modelling – Partial Least Squares (PLS-SEM) method with SmartPLS version 4.0 software. This method was chosen because it is capable of analysing causal relationships between latent variables with a relatively small sample size (Hair et al., 2021).

The analysis stages comprised two main steps:

1. Outer Model Evaluation (Measurement Model): This includes testing convergent validity (with outer loading indicators > 0.70 and AVE > 0.50), discriminant validity (using the Fornell-Larcker and HTMT methods), and

construct reliability (Composite Reliability  $> 0.70$  and Cronbach's Alpha  $> 0.60$ ). (Henseler, Ringle, & Sarstedt, 2015).

2. Inner Model Evaluation (Structural Model): This includes testing the R-square, f-square, Q-square, and path coefficient values to assess the strength of the relationship between variables. Significance testing was performed using the bootstrapping method with a 95% confidence level ( $t > 1.96$ ;  $p < 0.05$ ).

The PLS-SEM approach was used because it is more suitable for exploratory models with moderate sample sizes and data that are not entirely normally distributed (Sarstedt et al., 2022).

### Instrument Validity and Reliability Testing

Before testing the structural model, the validity and reliability of the research instruments were tested.

- 1) Convergent validity was evaluated based on the outer loading value of each indicator ( $>0.70$ ).
- 2) Construct reliability was evaluated using Composite Reliability ( $>0.70$ ) and Cronbach's Alpha ( $>0.60$ ).
- 3) Discriminant validity was assessed using the Fornell-Larcker method and the HTMT ratio to ensure conceptual differences between constructs (Henseler et al., 2015).

All validity and reliability test results are presented in detail in Chapter IV in the Outer Model Analysis section.

## RESULTS AND DISCUSSION

### Results

#### Assessing the Outer Model or Measurement Model

In data analysis using SmartPLS, the outer model was assessed through three main criteria, namely convergent validity, discriminant validity, and composite reliability. Convergent validity ensures that indicators can explain constructs well, discriminant validity confirms the differences between constructs so that they do not overlap, and composite reliability measures the consistency of indicators in representing latent variables. These three criteria are important to ensure the validity and reliability of the research model before testing hypotheses.

#### Convergent Validity

Convergent validity in measurement models with reflective indicators is assessed based on the strength of the correlation between item scores or component scores estimated using PLS software and the measured construct. A reflective indicator is considered to have good convergent validity if its correlation value exceeds 0.70. This value indicates that the indicator adequately explains the construct because its contribution is substantial and consistent in reflecting the latent variable. The results of the analysis using SmartPLS, shown in Table 1, indicate that the outer model values, namely the correlation between the construct and its indicators, have met the convergent validity criteria. This is evidenced by all indicators having a loading factor value above 0.70. Thus, the model used in this study is declared convergent valid because each indicator consistently and adequately represents the construct measured.

**Table 1. Outer Loadings (Measurement Model)**

	Business Ecosystem Sustainability (Y)	Dynamic Market Era (Z)	Entrepreneurship-Based HRM Integration (X)
BES1	0.785		
BES2	0.856		
BES3	0.850		
BES4	0.773		
DME1		0.790	
DME2		0.774	
DME3		0.820	
DME4		0.875	
DME5		0.766	
HRMI1			0.799
HRMI2			0.777
HRMI3			0.795
HRMI4			0.817
HRMI5			0.801

### Discriminant Validity

Discriminant validity is used to ensure that each construct of the latent variables is genuinely different and does not overlap with other variables. A model is considered to have good discriminant validity if each indicator shows the highest loading value on the latent variable it measures, compared to the loading values on other latent variables. In other words, indicators must reflect their own constructs more than other constructs. The results of the discriminant validity test in this study are shown as follows:

**Table 2. Discriminant Validity Values (Fornell-Larcker)**

	Business Ecosystem Sustainability (Y)	Dynamic Market Era (Z)	Entrepreneurship-Based HRM Integration (X)
Business Ecosystem Sustainability (Y)	0.817		
Dynamic Market Era (Z)	0.913	0.766	
Entrepreneurship-Based HRM Integration (X)	0.710	0.755	0.798

### Composite Reliability.

The validity and reliability of the construct can also be evaluated through the construct reliability value and the Average Variance Extracted (AVE) value for each latent variable. A construct is considered to have good reliability if its reliability value reaches a minimum of 0.70, while an AVE value exceeding 0.50 indicates that the indicator can explain most of the variance of the construct it measures. Thus, the combination of both ensures that the construct has adequate internal consistency and strong validity.

**Table 3. Composite Reliability Values**

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average Variance Extracted (AVE)
Business Ecosystem Sustainability (Y)	0.833	0.836	0.889	0.667
Dynamic Market Era (Z)	0.825	0.836	0.876	0.587
Entrepreneurship-Based Human Resource Management Integration (X)	0.857	0.860	0.897	0.636

Based on Table 3, it can be concluded that all constructs in this study have met the reliability criteria. This can be seen from the composite reliability value above 0.70 and the

AVE value exceeding 0.50, in accordance with the recommended standards. Thus, the research instrument used is declared consistent and capable of adequately representing latent variables.

Structural Model Testing (Inner Model)

The inner model or structural model testing aims to assess the relationship between constructs, the level of significance, and the R-square value of the research model. The evaluation was carried out by looking at the R-square value of the dependent construct, the t-test, and the significance level of the structural path coefficient. In this way, it can be determined how well the research model explains the dependent variables and assesses the strength of the relationship between latent variables.

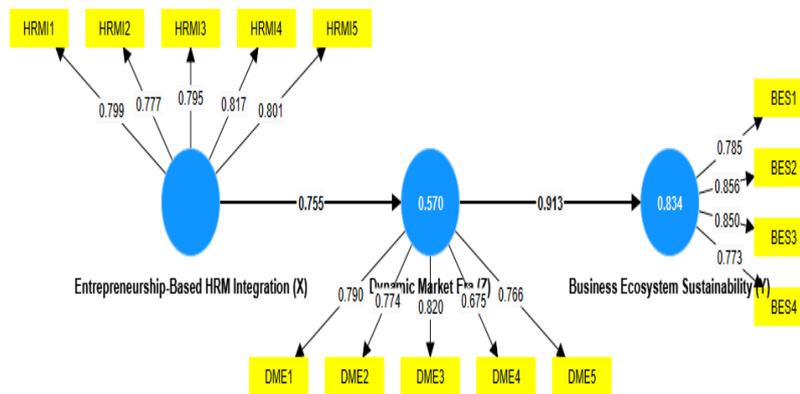


Figure 1. Tested structural model

In evaluating the model using PLS, the first step is to assess the R-square value for each dependent latent variable. The R-squared value provides information about the extent to which the independent variables explain the variation in the dependent variables. The higher the R-squared value, the better the model is at explaining the relationship between variables. The following table presents the estimated R-square values obtained through data processing using SmartPLS software, which forms the basis for assessing the predictive power of the research model.

Table 4. R-Square Values

	R-square	Adjusted R-square
Business Ecosystem Sustainability (Y)	0.834	0.831
Dynamic Market Era (Z)	0.570	0.564

Table 4 shows that the R-Square value for the Dynamic Market Era variable is 0.570, indicating that Entrepreneurial-Based Human Resource Management Integration explains 57.0% of the variation in the Dynamic Market Era, while other factors outside the research model influence the remaining 43.0%. Meanwhile, the R-Square value for the Business Ecosystem Sustainability variable reached 0.834, indicating that 83.4% of the variation in Business Ecosystem Sustainability can be explained by Entrepreneurship-Based Human Resource Management Integration, with the remaining 16.6% caused by variables outside the model. This relatively high R-Square value indicates that the research model has strong predictive capabilities and significantly explains the relationship between variables, particularly in the context of improving business ecosystem sustainability in the dynamic market of Magelang Regency.

## Hypothesis Test Results

### Direct (Partial) Effect

Direct (partial) effects in SmartPLS refer to the relationships between independent and dependent variables without passing through mediating variables. These effects are measured through path coefficients, t-statistics, and p-values. If the t-value is greater than 1.995 and the p-value is less than 0.05, then the direct effect is significant. This analysis shows the extent to which each independent variable can influence the dependent variable independently.

**Table 5. Results of Direct (Partial) Effect Hypothesis Testing**

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T-statistic ( O/STDEV )	P-values	Alpha	Conclusion
Dynamic Market Era (Z) → Business Ecosystem Sustainability (Y)	0.913	0.914	0.023	39.231	0.000	0.05	Influential Positive Significant
Entrepreneurship-Based HRM Integration (X) → Dynamic Market Era (Z)	0.755	0.762	0.047	15.953	0.000	0.05	Significantly Positive Influence

Table 5 shows that the partial test results of the variables studied all have t-values > 1.995 and p-values < 0.05.

#### 1. The Effect of the Dynamic Market Era (Z) on Business Ecosystem Sustainability (Y)

The analysis results indicate that the Dynamic Market Era has a positive and significant effect on Business Ecosystem Sustainability. The path coefficient value of 0.913, with a t-value of 39.231 (greater than the t-table value of 1.995) and a p-value of 0.000 (less than 0.05), indicates that the more dynamic the market conditions, the higher the level of business ecosystem sustainability. This indicates that the ability of business actors in Magelang Regency to adapt to market changes, technological innovations, and consumer demand dynamics plays an important role in strengthening the resilience and sustainability of the regional business ecosystem.

#### 2. The Influence of Entrepreneurship-Based HRM Integration (X) on the Dynamic Market Era (Z)

The analysis results indicate that Entrepreneurship-Based HRM Integration has a positive and significant effect on the Dynamic Market Era, with a path coefficient value of 0.755, a t-value of 15.953 (exceeding the t-table value of 1.995), and a p-value of 0.000 (less than 0.05). This finding illustrates that applying entrepreneurial principles in human resource management can enhance an organisation's ability to respond quickly and adaptively to changes in the business environment. Thus, entrepreneurship-based HRM integration is a key factor in strengthening business competitiveness and resilience in the increasingly dynamic market era in Magelang Regency.

### Mediation Effect

In this analysis, testing was conducted to determine the magnitude of the influence coefficient, both direct and indirect. Mediation testing was used to determine whether the mediation variable could bridge the relationship between the independent and dependent variables. If the P-value is less than 0.05, it can be concluded that the independent variable has a significant effect on the dependent variable ( ), both directly and through the mediation

variable. This can be seen in the indirect effect output, which shows the magnitude of the indirect effect. Thus, if the P-value for the mediation path is less than 0.05, it can be stated that there is a mediating effect in the research model (Sofyani, 2013).

**Table 6. Results of the Mediation Effect Hypothesis Test**

		Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T-statistic ( O/STDEV )	P- values	Description
Entrepreneurship-Based Integration (X) → Dynamic Market Era (Z) → Business Ecosystem Sustainability (Y)	HRM	0.689	0.698	0.053	13.121	0.000	Mediation

### The Effect of Entrepreneurship-Based HRM Integration (X) on Business Ecosystem Sustainability (Y) through the Dynamic Market Era (Z)

The analysis results indicate that Entrepreneurship-Based HRM Integration (X) has a significant indirect effect on Business Ecosystem Sustainability (Y) through the Dynamic Market Era (Z). This is indicated by a path coefficient value of 0.689, a t-value of 13.121, which is greater than the t-table value of 1.995, and a p-value of 0.000, which is less than 0.05. This finding indicates that applying human resource management oriented towards entrepreneurial values not only directly increases organisational effectiveness but also indirectly strengthens the sustainability of the business ecosystem by enhancing adaptability to market dynamics. Thus, the Dynamic Market Era serves as an important mediator, bridging the relationship between entrepreneurial-based HRM integration and the sustainability of the business ecosystem in Magelang Regency.

### Effect Size (f-square)

Effect size ( $f^2$ ) is used to assess the magnitude of the specific influence of independent variables on the predictive ability of dependent variables. The evaluation is carried out by comparing changes in the R Square value when an independent variable is removed from the model. The interpretation of the  $f^2$  value is as follows:  $f^2 < 0.02$  indicates a very small or insignificant effect,  $0.02 \leq f^2 < 0.15$  indicates a small effect,  $0.15 \leq f^2 < 0.35$  indicates a moderate effect, and  $f^2 \geq 0.35$  indicates a significant effect. Thus, this measure helps to determine how strongly each independent variable contributes to explaining the variation in the dependent variable in the research model. The analysis yielded the following effect sizes:

**Table 7. Effect Size (f-square)**

	f-square
Dynamic Market Era (Z) → Business Ecosystem Sustainability (Y)	5.016
Entrepreneurship-Based HRM Integration (X) → Dynamic Market Era (Z)	1.325

Based on the results of the table, it can be explained as follows:

1. The influence of the Dynamic Market Era (Z) on Business Ecosystem Sustainability (Y)  
The  $f^2$  value in the relationship between the Dynamic Market Era and Business Ecosystem Sustainability is 5.016, which falls into the category of a significant effect. This indicates that the Dynamic Market Era has a powerful influence on the sustainability of the business ecosystem. This means that the greater the ability of business actors to respond to market

changes, innovate, and adapt to the dynamics of the business environment, the more they contribute to creating a sustainable business ecosystem in Magelang Regency.

## 2. The Influence of Entrepreneurship-Based HRM Integration (X) on the Dynamic Market Era (Z)

The  $f^2$  value in the relationship between Entrepreneurship-Based HRM Integration and the Dynamic Market Era is 1.325, which is also classified as a significant effect. These results confirm that applying entrepreneurial principles in human resource management significantly enhances an organisation's ability to cope with market changes and competition. Thus, entrepreneurship-based HRM integration plays an important role in shaping adaptive and innovative market dynamics in Magelang Regency.

### *Discussion*

#### The Influence of Entrepreneurship-Based HRM Integration on the Dynamic Market Era

The results of the study indicate that Entrepreneurship-Based HRM Integration has a positive and significant effect on the Dynamic Market Era. This means that the higher the application of entrepreneurial values in human resource management, the greater the ability of organisations, especially MSMEs, to adapt to changes in the market, technology, and consumer behaviour. This finding reinforces the Resource-Based View (RBV) theory, which positions human resources as a strategic and unique resource in creating competitive advantage (Barney & Wright, 1998). In the context of SMEs in Magelang Regency, the application of entrepreneurial-based HRM practices – such as innovative training, creative performance-based reward systems, and employee empowerment to generate new business ideas – has been proven to increase sensitivity to changes in the business environment.

These results are consistent with the research by Nguyen and Luu (2023), which found that entrepreneurial HRM practices significantly contribute to increased market responsiveness and firm innovation in small businesses in developing countries. Research by Kusa, Duda, and Suder (2024) also confirms that integrating entrepreneurship into HRM enhances a company's adaptive capacity to external environmental changes, ultimately strengthening its long-term competitiveness. However, these results differ from the research by Rogoza and Agnieszka (2021), which found that in some cases, an entrepreneurial orientation in HRM does not always have a positive impact on market adaptation, especially when organisations have limited digital capacity or a rigid organisational culture. This difference can be explained by the research context in Magelang Regency, which shows that MSMEs actually have a more flexible organisational structure and direct owner involvement in decision-making, making entrepreneurial values easier to implement. Thus, this study provides a new contribution (novelty) in the context of SMEs in developing regions, specifically that integrating entrepreneurial values into HRM functions not only encourages internal innovation but also strengthens the organisation's ability to read and respond to local market dynamics.

#### The Influence of the Dynamic Market Era on Business Ecosystem Sustainability

The results of the study indicate that the Dynamic Market Era has a positive and significant effect on the Sustainability of the Business Ecosystem. This indicates that the ability of SME actors to cope with rapid market changes – including shifts in consumer preferences, developments in digital technology, and the intensity of competition – is crucial for

maintaining long-term business sustainability. This finding reinforces the Dynamic Capability theory proposed by Teece (2018), which states that the sustainability of modern businesses is highly dependent on the organisation's ability to sense (detect changes), seize (take advantage of opportunities), and transform (adjust internal resources).

These results are in line with Chatterjee's (2022) study, which found that dynamic market capabilities have a positive impact on organisational sustainability through increased innovation and adaptive efficiency. Similarly, Correggi et al. (2024) in Business Strategy and the Environment explain that strategically managed market dynamics can accelerate business transition towards sustainable practices through supply chain efficiency, digitalisation, and cross-sector collaboration. However, these results differ slightly from the research by Abu Rumman and Al-Abbadi (2023), which found that not all organisations can convert market dynamics into sustainable advantages, especially when management support and organisational policies are inconsistent. In this study, strong managerial support from MSME actors—who also act as business owners—enables direct responses to market dynamics without lengthy bureaucracy, thereby strengthening business sustainability. This difference emphasises the unique context of MSMEs in Magelang Regency, where small and adaptive business structures enable them to react quickly to external changes. The novelty of this study lies in the empirical evidence that the adaptive capacity of MSME actors to market dynamics serves not only as a survival mechanism but also as a sustainable strategy for creating a resilient and innovative business ecosystem.

#### The Role of the Dynamic Market Era as a Mediator between Entrepreneurial-Based HR Management Integration and Business Ecosystem Sustainability

The test results show that the Dynamic Market Era (Z) significantly mediates the relationship between Entrepreneurial-Based Human Resource Management Integration (X) and Business Ecosystem Sustainability (Y). This finding indicates that applying entrepreneurial values in human resource management will enhance business sustainability, both directly and by improving the organisation's ability to adapt to market dynamics. Theoretically, these results confirm that human resources managed with entrepreneurial principles are capable of creating dynamic capabilities that are the primary source of business sustainability (Teece, 2018). Adaptive and continuous learning-oriented HRM enables organisations to build flexible, creative, and responsive work systems to market opportunities. This study reinforces the findings of Campos-García et al. (2024), who state that sustainable HRM practices have a strong relationship with an organisation's ability to adapt to environmental and technological changes. Similarly, the study by Sakib et al. (2025) shows that sustainable human resource management plays an important role in maintaining a balance between an organisation's economic goals and social responsibilities.

This study also complements previous findings by showing that adaptive capabilities (dynamic market responsiveness) are a key mechanism linking entrepreneurial-based HRM with business sustainability. In other words, integrating entrepreneurship into HRM does not necessarily improve sustainability unless it is accompanied by the organisation's ability to respond to external changes. This study is distinguished from previous research that has focused more on large companies (Nguyen & Luu, 2023; Chatterjee, 2022). This study presents a new context—specifically, MSMEs in developing regions—which demonstrates that the mediating effect of the Dynamic Market Era is significantly more substantial due to the

characteristics of flexibility and direct decision-making by business owners. The novelty of this study lies in the empirical evidence that market adaptability (Dynamic Market Era) is not merely a passive environmental variable but an active mechanism that strengthens the relationship between entrepreneurial HRM and business ecosystem sustainability.

## CONCLUSION

This study aims to analyse how the integration of entrepreneurial human resource management contributes to the sustainability of the business ecosystem in the context of MSMEs in Magelang Regency, using the dynamic market era as a mediating variable. Based on the analysis and discussion, several important conclusions can be drawn. First, the integration of entrepreneurial human resource management has been proven to influence the dynamic market era positively. This means that applying entrepreneurial values in human resource management can enhance SME actors' ability to adapt to changes in the market, technology, and consumer needs. HR management that emphasises creativity, innovation, entrepreneurial training, and autonomy for employees has been proven to encourage an adaptive culture that strengthens business resilience. Second, the dynamic market era significantly affects the sustainability of the business ecosystem, indicating that MSMEs' ability to respond to changes in the business environment plays an important role in maintaining business continuity. MSMEs that can read market trends, take advantage of opportunities, and innovate in the face of competitive challenges have greater potential to create a resilient and sustainable business ecosystem. Third, this study proves that the dynamic market era acts as a significant mediator in the relationship between entrepreneurial-based HRM integration and business ecosystem sustainability. Thus, entrepreneurial-oriented HRM strategies not only directly affect business sustainability but also indirectly affect it through increased adaptability to market dynamics. Overall, this study confirms that the sustainability of MSMEs in Magelang Regency can be achieved through the synergy between human resource innovation and adaptability to market changes. These two factors reinforce each other in building a resilient, inclusive, and highly competitive business ecosystem.

Theoretically, the results of this study reinforce and expand the concepts of Resource-Based View (RBV) and Dynamic Capability Theory, by showing that entrepreneurial human resource management can be a strategic resource that builds dynamic organisational capabilities. This research also contributes to the development of literature on sustainable business ecosystems by introducing the important role of the dynamic market era as a link between internal organisational factors (entrepreneurial human resources) and business sustainability outcomes. Thus, this research provides a new conceptual basis that the ability to adapt to the market is not merely a result of the environment but a form of strategic competence that can be developed through innovative human resource policies. In practical terms, the results of this study provide important guidance for MSME actors and local policy makers. MSME actors are expected to start implementing an entrepreneurial-based HR management approach with a focus on innovation training, employee empowerment, and the application of a creativity-based reward system. Local governments can strengthen their support for MSME HR capacity building through integrated entrepreneurship training programmes, business incubation, and local market digitalisation. In addition, MSME associations can play a role in expanding cross-sector collaboration networks to create a more dynamic, inclusive, and sustainable business ecosystem.

This study has several limitations that need to be considered. First, the scope of the study is limited to MSMEs in Magelang Regency, so the results cannot be generalized to other regions or industrial sectors with different characteristics. Second, the data used is cross-sectional, so the causal relationships shown are limited to a specific period of time and do not capture long-term dynamics. Third, the research instrument focused on respondents' perceptions through questionnaires, so the possibility of perception bias cannot be avoided entirely. Fourth, this research model only involved three main variables, while other external factors, such as government policy support, digital technology, or business social networks, were not explicitly included.

These limitations do not diminish the validity of the findings; instead, they provide a strong basis for further research to expand the understanding of the integration of entrepreneurial HRM and MSME sustainability. Based on the research results and limitations, several recommendations can be proposed for future research and practice. First, for future researchers, it is recommended to expand the research scope to include several other regions with different economic and social characteristics to gain a comparative understanding of SME adaptation patterns to market dynamics. We can also use a longitudinal approach to observe changes in adaptive behaviour and business sustainability in the long term. Second, other variables such as digital transformation, green innovation, social capital, and public policy support can be included in the model to understand the external factors that influence the relationship between entrepreneurial HRM, market dynamics, and business sustainability. Third, from a practical perspective, MSME actors need to improve their human resource capacity through collaboration with training institutions and universities. At the same time, local governments are advised to strengthen policies that encourage innovation ecosystems and digital transformation as the foundation for local business sustainability. Finally, this study recommends using the concept of integrating entrepreneurship-based human resource management and dynamic market capabilities as a basis for formulating sustainable SME development policies in Indonesia, especially in growing regions such as Magelang Regency.

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