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The Impact of Entrepreneurial Orientation and Product Innovation on Business Performance: The Role of Digitalization as an Intervening Variable

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ABSTRACT
This study investigates the indirect effect of Entrepreneurial Orientation and Product Innovation on Business Performance through Digitalization as an intervening variable in the cracker industry of Garut City. As SME play a vital role in economic resilience and local development, enhancing their business performance is crucial. Entrepreneurial Orientation and Product Innovation are widely recognized as key strategic capabilities, while Digitalization offers transformative potential for operational efficiency and market expansion. A quantitative method was used with a sample of 316 cracker SME actors selected via simple random sampling. Data were collected through questionnaires and analyzed using Structural Equation Modeling with SmartPLS 3.0 version. The findings confirm that Entrepreneurial Orientation and Product Innovation significantly directly affect Business Performance and significantly influence Digitalization. Moreover, Digitalization has a strong positive effect on Business Performance and significantly mediates the relationship between Entrepreneurial Orientation and Product Innovation toward Business Performance. These findings highlight the strategic integration of entrepreneurial behavior, innovation, and digital adoption as a pathway to enhanced performance among SME in the digital era. This research contributes to theoretical development and practical guidance for small business transformation. Future studies should include broader industry samples and explore additional moderating or mediating factors such as organizational culture or customer experience.

Keywords: Entrepreneurial Orientation, Product Innovation, Digitalization, Business Performance
JEL Code: E44, F31, F37, G15.

I. Introduction

SME in Indonesia have an important role in overcoming various social, economic, and domestic problems, such as high poverty levels, unemployment, and inequality. The establishment and advancement of SMEs are projected to contribute meaningfully to improving various economic challenges in Indonesia. The SME sector has succeeded in absorbing labor up to 57.9 million people in various regions. Although the

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number of SME business units experiencing rapid growth is still not optimal, it faces several obstacles. In addition, the former President of the Republic of Indonesia said that highly resilient SME can support the national economy, even amid a global crisis (Azzahra, B., & Wibawa, 2021). SME are currently showing significant growth and development in Indonesia. SME play an important role in driving the rate of national economic growth. To support these developments, performance evaluation or measurement becomes a crucial aspect. Improving business performance is difficult, so various efforts and appropriate strategies are needed. Business Performance Assessment requires in-depth research to identify factors that can drive performance improvement. Lack of attention to some SME results in limited understanding of entrepreneurial orientation and innovation (Zarefar & Oktari, 2021). Product innovation increases the company's capacity to produce high-quality products, strengthens competitive advantage, and significantly impacts company performance (Anggraini, 2022). Advances in internet technology marked the beginning of the Industrial Revolution 4.0 era. Fast and easy access to information through the internet opens up new opportunities for SMEs to market their products. The internet has changed the traditional and digital marketing paradigm (Azzahra, B., & Wibawa, 2021). Performance can be interpreted as the results of achievements from the company's operational activities, especially in Business Performance (Febrianti & Herbert, 2022).

The purpose of this study is to determine the effect of Entrepreneurial Orientation and Product Innovation on Business Performance with Digitalization as Intervening Variable at the Industry of Cracker on Garut City, because to be able to maintain SME for a long time, one of the approaches that can be given to SME, namely insights into Entrepreneurial Orientation, Product Innovation, and Digitalization, because Entrepreneurial Orientation is seen an having the ability to improve the performance of a business, by understanding how Entrepreneurial Orientation, Product Innovation, and Digitalization can affect the performance of a business in the Industry Cracker in Garut City. Previous research examining the influence of entrepreneurial orientation and product innovation on business performance, such as in the root of the fragrance industry in Garut Regency, has provided an initial foundation for the importance of entrepreneurial behavior and innovation in increasing business competitiveness. However, the research is still limited to the traditional industry context without considering the dynamics of changes that occur due to the development of digital technology. In today's digital transformation era, digitalization is an important factor that can strengthen the relationship between entrepreneurial orientation, innovation, and business performance. Unfortunately, little research still places digitalization as an intervening variable in the framework of this relationship, especially in the traditional food industry sector, such as the cracker industry. Therefore, this study aims to fill this gap by examining the role of digitalization as an intervening variable in the relationship between entrepreneurial orientation and product innovation on business performance, in the context of the cracker industry that is adapting to digital technology to expand the market and improve operational efficiency (Fuadi, 2024). Then, this study focuses on the influence of entrepreneurial orientation and product innovation on business performance, as done in the textile and apparel industry in Garut Regency, which has provided an understanding of the importance of internal factors of business actors in improving business performance. Although the results are relevant for the middle to upper manufacturing industry sector, there are limitations in their application to traditional food industry sectors, such as the cracker industry, which have different characteristics in business scale, resources, and technology adoption. In addition, the study has not considered the role of digitalization as an important element that can strengthen or mediate the relationship between entrepreneurial orientation, product innovation, and business performance. Amid increasing digital transformation in the SME sector, digitalization is crucial in expanding market access, process efficiency, and sustainable innovation. Therefore, new research needs to be conducted to fill this gap by examining the role of digitalization as an intervening variable in the cracker industry facing challenges and opportunities in the digital era (Rahmat, 2024).

Table 1. Total of Cracker SME in Garut City

Year	Frequency
2019	3
2020	4

ISSN [Online]: 2776-6349

Year	Frequency
2021	15
2022	106
2023	659
2024	719

Source: (DiskopUKM, 2025)

Table 1 shows the projected growth of the total cracker SME in Garut City from 2019 to 2024. The table results show a relatively increasing pattern from year to year. The peak occurred in 2023 with an increase of 719 SME, or around 45% from the total period. Then, in 2019 and 2020, the total number of SMEs only increased by less than 1% for the total period, which is assumed to have occurred due to the prolonged COVID-19 pandemic.

Today, SMEs urgently need the role of digitalization as a moderating factor that can strengthen the relationship between core business activities, such as entrepreneurial orientation and product innovation, to improve overall business performance. Digitalization is no longer just an option, but a strategic necessity, especially after the COVID-19 pandemic, which forced all economic activities, including buying and selling, to be carried out online from home. In this situation, SME actors who can adapt to selling products through marketplaces, opening online stores, promoting products on social media, and using digital cashier applications and automatic financial record-keeping have proven more resilient in maintaining and improving their business performance. Digitalization supports operational efficiency through an application-based stock management system, speeds up the transaction process, facilitates customer data management, and improves the accuracy of financial statements. Therefore, digitalization needs to be positioned as an important moderating variable that can strengthen the influence of entrepreneurial orientation and product innovation on SME business performance, not only in marketing aspects, but also in more professional and integrated operational and financial management.

II. Literature Review and Hypothesis Development

2.1. Business Performance

Business Performance refers to the extent to which an organization successfully executes its activities over a specific period, often evaluated against predetermined benchmarks such as historical data, efficiency standards, or strategic objectives. (Yaskun & Sudarmiatin, 2021). It signifies how well a company fulfills its mission, goals, and overall vision by effectively implementing its tasks and responsibilities. (Barney, 1991). Furthermore, business performance can be measured in financial and non-financial terms. (Wheelen & Hunger, 1982). Non-financial measures include goals such as satisfaction and worldwide success ratings made by owners or managers. Financial metrics include sales growth and return on investment. (Arabeche et al., 2022). Ultimately, Business performance also encompasses how well a company delivers value to customers through the quality of its products or services. (Siagian et al., 2021). Business Performance includes four indicators: target, quality, finishing time, and obeying the principles. (Anggraini, 2022).

2.2. Entrepreneurial Orientation

Entrepreneurial Orientation plays a pivotal role in determining the success of a business, particularly among micro, small, and medium enterprises. This idea integrates core elements significantly influencing strategic choices (Maesaroh et al., 2023). As a guiding value system, Entrepreneurial Orientation helps define a firm's direction and strategic priorities, ultimately fostering competitive advantage and enhancing overall performance (Ritala et al., 2021). Organizations with a strong entrepreneurial mindset are more capable of seizing emerging opportunities, creating innovative products, and sustaining a competitive advantage in an ever-changing market environment. A high level of Entrepreneurial Orientation is strongly linked to better

ISSN [Online]: 2776-6349

business results and increased organizational resilience (Falahat et al., 2020). Entrepreneurial Orientation measures this study's three indicators: innovation, proactivity, and risk-taking (Azzam et al., 2023).

2.3. Product Innovation

Product Innovation has been widely recognized as a vital strategy for companies seeking sustainable growth and competitive advantage. It refers to developing and launching new or significantly improved products that deliver distinct value to customers. Unlike a one-time event, Product Innovation is a dynamic journey from ideation to implementation, requiring continuous adaptation to market changes. (Lestari et al., 2022). Product Innovation, from another perspective, contributes directly to Business Performance by enabling firms to attract new customers, increase revenue streams, and solidify their market position. It is particularly crucial in industries affected by rapid technological shifts, changing consumer behaviors, and global competition. As such, continuous investment in innovative capabilities has become essential for firms aiming to stay relevant and competitive. (Fatonah & Haryanto, 2022). Product Innovation involves four indicators: products that constantly innovate, product quality, many product variations, and style and product design. (Herman & Nohong, 2022).

2.4. Digitalization

In modern business transformation, particularly in the era of Industry 4.0, Product Innovation is closely intertwined with Digitalization, which acts as a key enabler for innovation implementation and market responsiveness. Digitalization is important in enhancing the operational effectiveness of the SME ecosystem of Industry 4.0 in Indonesia. By embracing digital technologies and utilizing e-commerce platforms, business actors can expand their market reach, streamline financial record-keeping, and perform more precise and timely data analysis (K. Kraus et al., 2021). Furthermore, the digitalization of business processes supports creating new employment opportunities in full-time and freelance capacities, contributing to efforts to reduce unemployment. Nevertheless, SMEs must demonstrate a strong commitment and readiness to leverage the benefits of digitalization adoption fully. This includes integrating technological tools and continuously adapting and reorienting their business models and workflows in line with ongoing digital advancements (Kapoor et al., 2022). Indicators of Digitalization focus on sustainable business realization, innovation successfully accepted by the market, and team member experience and productivity (Arifin et al., 2023). From a practical perspective, this linkage implies that SMEs that integrate digital technologies into their innovation processes are more likely to deliver products aligned with current market needs and preferences. For instance, digitally analyzing consumer data enables faster iteration of product designs, while digital platforms facilitate more agile testing and feedback loops. Moreover, digitalization supports the scalability of innovative products by simplifying distribution channels and payment systems, which are often barriers for small businesses. Thus, the synergy between digital adoption and product innovation does not merely represent a technological shift but a strategic imperative for SME striving for sustained competitiveness.

H1: Entrepreneurial orientation has a positive and significant effect on business performance
H2: Product innovation has a positive and significant effect on business performance
H3: Entrepreneurial orientation has a positive and significant effect on digitalization
H4: Product innovation has a positive and significant effect on digitalization
H5: Digitalization has a positive and significant effect on business performance
H6: Digitalization significantly mediates the relationship between Entrepreneurial Orientation and Business Performance
H7: Digitalization significantly mediates the relationship between Product Innovation and Business Performance

ISSN [Online]: 2776-6349

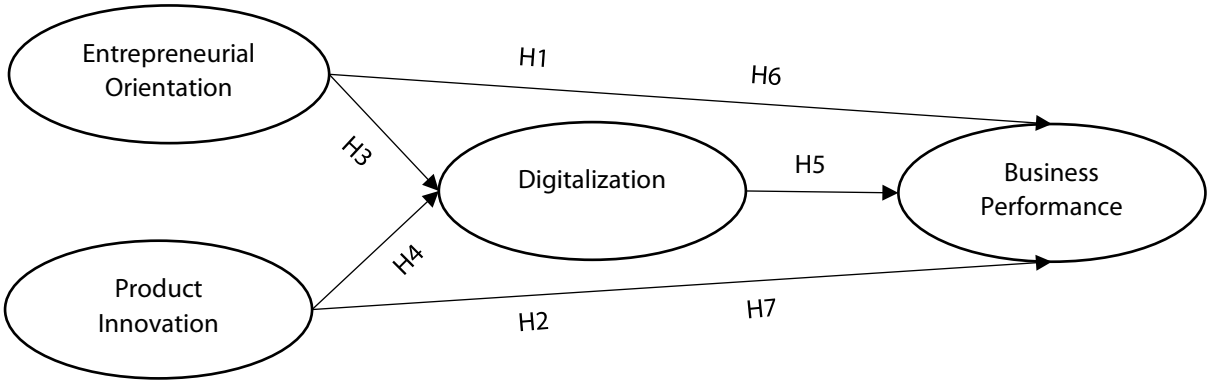

Figure 1. Conceptual Framework

III. Research Method

3.1. Types of Research, Population, and Sample

This quantitative study investigates a specific population or sample by collecting numerical data, emphasizing hypothesis testing through standardized instruments and statistical data processing (Sugiyono, 2020). The population in this study consists of the cracker industry in Garut City (Sekaran & Bougie, 2016). The sample was selected using probability sampling with a simple random sampling method. To ensure the relevance of the sample to the research objectives, specific inclusion criteria were established: the business must be actively operating, formally registered with the local trade office, and have been in operation for at least two years. These criteria were intended to ensure that respondents had sufficient business experience and operational stability to provide reliable data on the variables under study. Based on a 95% confidence level and a 5% margin of error, the required sample size was calculated using Slovin's formula:

$$n = \frac{N}{1 + N(e)^2}$$

From the formula above, the number of samples can be determined using Slovin's formula with an expected proportion of 5% margin of error. N 1506 margin of error (5% or 0,05).

$$n = \frac{1506}{1 + 1506(0{,}05)^2}$$
$$n = \frac{1506}{1 + 1506(0{,}0025)}$$
$$n = \frac{1506}{4{,}765}$$
$$n = 316$$

With a population of 1506, the sample was determined using Slovin's formula with an error margin of 5%, resulting in 316 respondents. The 5% margin of error was chosen to balance precision and feasibility, providing a statistically acceptable level of accuracy for generalizing the findings while remaining manageable regarding time and resource constraints typically faced in field data collection.

3.2. Sampling Method and Measurement Scale

The data collection method in this study is questionnaires, an essential step in gathering relevant data. A questionnaire is a technique for collecting data by distributing written questions or statements to respondents for them to answer. (Sugiyono, 2020). The distribution of questionnaires aims to obtain data,

ISSN [Online]: 2776-6349

which is processed using the Likert scale, a scale used to measure individuals' attitudes, opinions, and perceptions of social phenomena. (Sugiyono, 2020). Before respondents fill out the questionnaire, the researcher will explain the purpose of the study and encourage them to give honest answers to obtain accurate results. The questionnaire is designed with a score-based scoring system, where each alternative answer is graded in stages. (Sekaran & Bougie, 2016). The Likert scale measures four main variables: Entrepreneurial Orientation, Product Innovation, Digitalization, and Business Performance. Entrepreneurial Orientation includes innovation, proactivity, and risk-taking. (Azzam et al., 2023). Product Innovation involves products that constantly innovate, product quality, many product variations, style, and product design. (Herman & Nohong, 2022). Digitalization focuses on sustainable business realization, innovation successfully accepted by the market, and team member experience and productivity. (Arifin et al., 2023). Business Performance includes target, quality, finishing time, and obeying the principles. (Anggraini, 2022).

3.3. Data Analysis Method

This study employs Structural Equation Modeling (SEM) based on Partial Least Squares (PLS) using SmartPLS software (Putra et al., 2025). The evaluation of the measurement model (outer model) includes convergent validity (loading factor >0.7), discriminant validity (HTMT <0.90 or 0.85), and reliability (Hair et al., 2021), assessed by composite reliability or Cronbach Alpha >0.7 and AVE >0.5 (Sarstedt et al., 2020). The structural model evaluation (inner model) uses R-squares, Q-squares, and bootstrapping with 500 subsamples to examine the significance of the path coefficient at 5% level (Sekaran & Bougie, 2016). Hypothesis testing uses P-values, with $P \leq \alpha$ indicating a significant link (Henseler et al., 2015). The instrument validity test for the entrepreneurial orientation variable was performed using Pearson's correlation analysis between each item and the total score. The results showed that the entire item had a significant correlation value (sig. < 0.05), with the correlation coefficient ranging from 0.522 to 0.852. This shows that all items in the instrument are declared valid and can measure the construct in question consistently (IBM SPSS 23, 2025). Furthermore, the results showed that all items in the product innovation variable had a significant correlation value (sig. < 0.05), with coefficients ranging from 0.526 to 0.846. This indicates that all items are valid and feasible to measure the construct being studied, as they have a strong and significant relationship to the total score (IBM SPSS 23, 2025). Then the results showed that all items in the digitization variable had a significant correlation value (sig. < 0.05), with the correlation coefficient ranging from 0.571 to 0.771. This indicates that the entire item is declared valid because it shows a strong and significant relationship with the total score, so it can be used to measure the construct in question consistently and accurately (IBM SPSS 23, 2025). Moreover, the test results showed that all items in the business performance variable significantly correlated to the total score (sig. < 0.05), with coefficient values ranging from 0.618 to 0.84. This shows that all items in the instrument are declared valid and can measure the constructs being studied consistently (IBM SPSS 23, 2025).

According to the results of reliability tests using Corrected Item-Total Correlation analysis and Cronbach's Alpha if Item Deleted, it is known that most items on the entrepreneurial orientation variable have a correlation value above 0.5, which indicates that the items are consistent in measuring the same construct. The highest Corrected Item-Total Correlation value was recorded at 0.785 (X1008), while the lowest was 0.425 (X1009). Although item X1009 has the lowest correlation value, it is still within the minimum acceptable limit. Additionally, Cronbach's Alpha if Item Deleted value ranges from 0.886 to 0.909, which means that no single item significantly degrades the overall reliability of the instrument. Thus, the instrument can be said to be reliable and feasible to use in collecting research data, because it has a high internal consistency (IBM SPSS 23, 2025). Then the reliability test results showed that all items in the product innovation variable had a Corrected Item-Total Correlation value above 0.5, with a value range between 0.563 and 0.805. The value indicates that all items correlate fairly strongly with the total score, thus consistently measuring the same construct. In addition, Cronbach's Alpha if Item Deleted value is entirely above 0.89, indicating that there is not a single item that, if deleted, will significantly improve the instrument's reliability. In fact, the highest value of Cronbach's Alpha if Item Deleted was recorded at 0.911, which remains in the very high reliability category.

GOLDEN RATIO
ISSN [Online]: 2776-6349

Therefore, it can be concluded that the instruments used in this study have good internal consistency and are reliable for use in further data collection (IBM SPSS 23, 2025). The reliability test results showed that all items in the digitization variable had a Corrected Item-Total Correlation value above 0.5, which means that all items in this instrument have a sufficient contribution in forming the internal consistency of the measured construct. The correlation value ranges from 0.478 to 0.707, where although there are some items, such as Z004 (0.478) and Z006 (0.550), are close to the lower limit, the value is still in the acceptable category. Meanwhile, Cronbach's Alpha if Item Deleted value ranges from 0.863 to 0.879, which indicates that removing any of the items will not significantly improve the total reliability of the instrument (IBM SPSS 23, 2025). Thus, all items were declared reliable and feasible for data collection in the study, as the instruments showed good internal consistency. Moreover, the reliability test results showed that all items in the business performance variable had a Corrected Item-Total Correlation value above 0.5, which indicates that the items have an adequate relationship to the total score and consistently measure the same construct. Correlation values range from 0.512 (Y003) to 0.730 (Y006), indicating an acceptable internal consistency level. Additionally, Cronbach's Alpha if Item Deleted value is in the range of 0.881 to 0.902, so no item significantly degrades overall reliability if deleted. Thus, this instrument is declared reliable and feasible for measuring research variables because it has met the requirements of good internal consistency (IBM SPSS 23, 2025).

IV. Results and Discussion

4.1. Respondent Demographic

Respondent demographics are the basic characteristics of study participants, such as age, gender, education, and occupation. These data help describe the sample profile and allow researchers to analyze whether demographic differences affect the findings. (Putra et al., 2025).

Table 2. Sample Criteria (N = 316)

Measurement	Frequency	%
Gender		
Man	159	50.3
Female	157	49.7
Total	316	100
Age (years-old)		
18 – 25	11	3.5
26 – 32	52	16.5
33 – 40	121	38.3
> 40	132	41.7
Total	316	100
Education Level		
SMA/SMK/Sederajat	183	57.9
Bachelor	123	38.9
Masters	8	2.5
Doctoral	2	0.7
Total	316	100

Based on Table 2, most respondents were in the age range of 18-25 years, namely 11 peoples (3.5%), followed by 26-32 years of age, as many 52 people (16.5%), respondents aged 33-40 years totaled 121 people (38.3%), and while respondents ages over 40 totaled 132 people (41.7%). Regarding gender, most respondents were male, as many as 159 people (50.3%), while women totaled 157 people (49.7%). Based on the latest education, most respondents have a high school/vocation high school education, as many as 183 people (57.9%), followed by respondents have a high Bachelor's education (S1), as many as 123 people (38.9%), and

those with Masters / Doctoral education (S2/S3) only 10 persons (3.2%). This shows that respondents are dominated by productive age groups and middle education (SMA/SMK).

4.2. Convergent Validity

The outer model or measurement model was evaluated using four key criteria: average variance extracted (AVE), convergent validity, discriminant validity, and internal consistency reliability (composite reliability and Cronbach's alpha). Indicators are reliable if they have an outer loading value of ≥ 0.50. Based on the results in Table 3, all indicators for Entrepreneurial Orientation, Product Innovation, Digitalization, and Business Performance have loading values above 0.70, indicating strong reliability and adequate convergent validity. Since no indicators fall below the threshold, none were removed from the model, confirming that the measurement model is valid and can accurately represent the latent constructs for further structural analysis. (Mubarrok et al., 2024). The following is the outer loading value of each indicator on the research variables:

Table 3. Outer Loading Value

Variable	Indicators	Outer Loading
Entrepreneurial Orientation	EO1	0.804
	EO2	0.847
	EO3	0.849
Product Innovation	PI1	0.778
	PI2	0.780
	PI3	0.778
	PI4	0.798
Digitalization	D1	0.746
	D2	0.826
	D3	0.838
Business Performance	BP1	0.768
	BP2	0.797
	BP3	0.824
	BP4	0.764

If the outer loading value is more than 0.7, the indicator is considered to have convergent validity. According to Table 3 and Figure 2, each indicator of the research variable has an outer loading value greater than 0.7, suggesting that there are no variable indicators with an outer loading less than 0.5, implying that all indicators are practicable or valid for research usage and may be utilized for additional study.

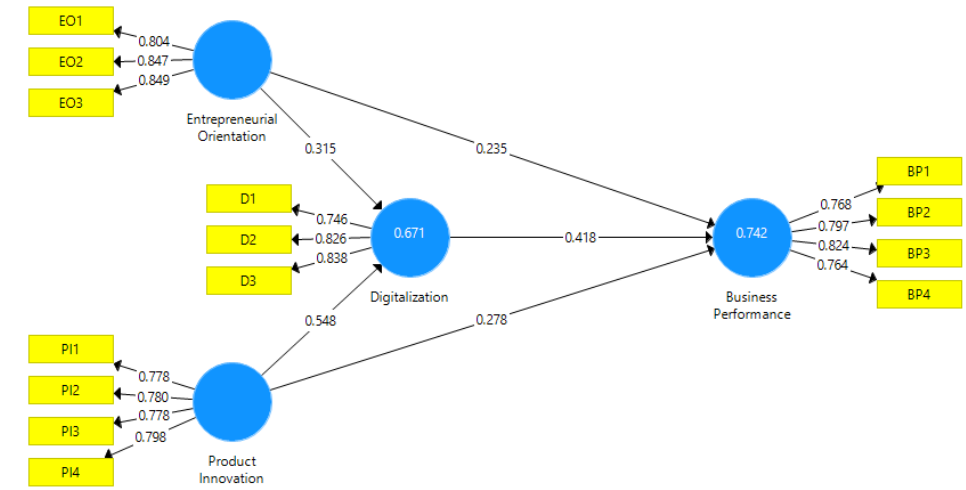

Figure 2. Outer Model

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4.3. Discriminant Validity

After measuring convergent validity, the next step is to measure discriminant validity. One looks at the square root value of each construct's average variance extracted (AVE) to assess discriminant validity. If the AVE value of each construct is greater than 0.50, it is said that the construct variable has good discriminant validity. (Mubarrok et al., 2024). The following is the AVE value of each variable in this study:

Table 4. Average Variance Extracted Value

Variable	AVE (Average Variance Extracted)	Information
Entrepreneurial Orientation	0.695	Valid
Product Innovation	0.614	Valid
Digitalization	0.647	Valid
Business Performance	0.622	Valid

Based on Table 4, each variable in this study shows the AVE (Average Variance Extracted) value, which is >0.5. Each variable in this study has a value for Entrepreneurial Orientation of 0.695, Product Innovation of 0.614, Digitalization of 0.647, and Business Performance of 0.622. This shows that each variable in this study can be considered valid regarding discriminant validity.

4.4. Reliability Test

Composite Reliability is a measure used to assess a variable's internal consistency. Both metrics have a value range between 0 and 1, where higher values indicate better reliability. A variable is considered reliable if Composite Reliability and Cronbach's Alpha values exceed 0.7. This means that the indicators within the variable are mutually consistent and can be relied upon to measure the same construct (Safitri & Komaryatin, 2025). Below is the composite reliability value of each variable in this study:

Table 5. Composite Reliability

Variable	Composite Reliability
Entrepreneurial Orientation	0.872
Product Innovation	0.864
Digitalization	0.846
Business Performance	0.868

If a variable's composite reliability value exceeds 0.7, it can be claimed to meet the composite reliability requirement. Table 5 demonstrates that the composite reliability value for all research variables exceeds 0.7. Entrepreneurial Orientation =0.872, Product Innovation =0.864, Digitalization =0.846, and Business Performance =0.868. This demonstrates that each variable has satisfied the composite dependability, implying that the total variable has a high level of reliability.

4.5. Cronbach Alpha

Cronbach's Alpha is a reliability measure to assess a variable's internal consistency. Both metrics have a value range between 0 and 1, where higher values indicate better reliability. A variable is considered reliable if Composite Reliability and Cronbach's Alpha values exceed 0.7. This means that the indicators within the variable are mutually consistent and can be relied upon to measure the same construct (Safitri & Komaryatin, 2025).

Table 6. Cronbach Alpha

Variable	Cronbach Alpha
Entrepreneurial Orientation	0.782
Product Innovation	0.790
Digitalization	0.726
Business Performance	0.797

Table 6 demonstrates that the Cronbach Alpha value of all variables in this study is more than 0.6, indicating that the alpha values meet the standards for all constructs to be trustworthy. Entrepreneurial Orientation =0.782, Product Innovation =0.790, Digitalization =0.726, and Business Performance =0.797.

4.6. Inner Model Analysis

This study will explain the results of the goodness-of-fit test, path coefficient test, and hypothesis testing.

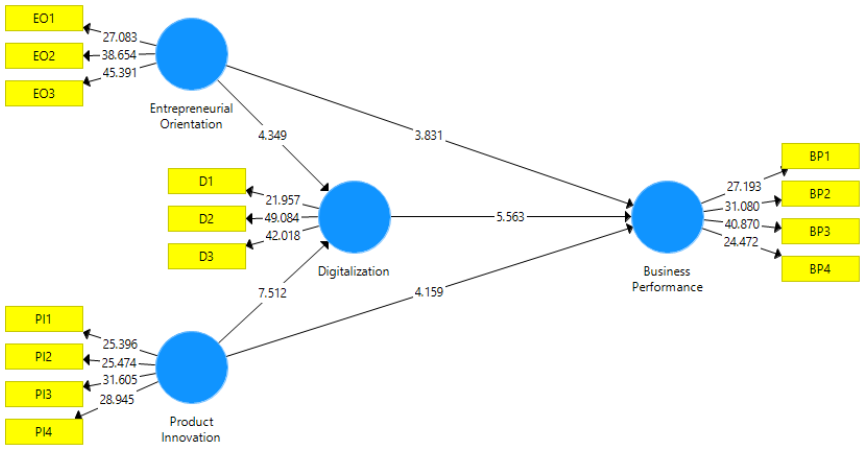

Figure 3. Inner Model

4.7. Evaluation of Model Fit: R-Square and Q-Square Analysis

This model goodness test consists of two tests, namely R-Square (R2) and Q-Square (Q2). The R-Square value shows the determination of exogenous variables on endogenous variables (Ghozali & Latan, 2021). The R-square test (R2) or the reliability test states how reliable an item/indicator is in forming a variable. There are three categories in the grouping of R-squared values. If the R-square value is 0.75, it is included in the strong category; the R-square value of 0.50 is included in the moderate category, and 0.25 in the weak category (Haerdiansyah Syahnur & Bahari, 2023). The R-square value of the dependent variable obtained in this research model can be seen in Table 7 below.

Table 7. R-Square Value

Variable	R-Square	R-Square Adjusted
Digitalization	0.671	0.668
Business Performance	0.742	0.740

Based on Table 7, the R-Square value shows the magnitude of the influence of the observed variables. Entrepreneurial Orientation and Product Innovation affect Digitalization by 66.8% (moderate category), and Business Performance by 74% (moderate category). These values illustrate the independent variables' level of relationship and influence on the dependent variable.

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Q-square (Q2) measures the predictive relevance of a model, indicating its ability to predict endogenous constructs. A Q^2 value greater than zero shows the model has sufficient predictive accuracy, while zero or below suggests poor predictive capability. The following are the results of the calculation of the Q-Square value:

$$Q2 = 1 - \frac{SSE}{SSO}$$

$$Q2 = 1 - \frac{691.401}{1.264.000}$$

$$Q2 = 1 - 0.547$$

$$Q2 = 0.453$$

The calculation results show a Q-Square of 0.453, which means that the model can explain 45.3% of the data diversity, while factors outside the model influence 54.7%. Thus, this model has a low predictive relevance.

4.8. Hypotheses Test

The path coefficient score table is used for hypothesis testing in this study to measure the influence of variables. The testing is conducted through bootstrapping to obtain t-statistics and p-values. A p-value above 0.05 indicates no significant direct effect. With a significance threshold of 1.96 (or 5%), an effect is considered statistically significant if the t-statistic exceeds 1.96. Hypothesis testing was carried out using SmartPLS 3 software, and the results were based on the path coefficient scores. The bootstrapping procedure was performed using 500 subsamples, which is considered sufficient in PLS SEM to ensure the reliability and stability of the parameter estimates. (Haerdiansyah Syahnur & Bahari, 2023).

Table 8. Path Coefficient (Direct Effect)

	Hypothesis	Original Sample	T-statistic	P-value	Information
Entrepreneurial Orientation→Business Performance	H1	0.235	3.831	0.000	Significant
Product Innovation→Business Performance	H2	0.278	4.159	0.000	Significant
Entrepreneurial Orientation→Digitalization	H3	0.315	4.349	0.000	Significant
Product Innovation→Digitalization	H4	0.548	7.512	0.000	Significant
Digitalization→Business Performance	H5	0.418	5.563	0.000	Significant

Based on Table 8, the results of hypothesis testing show that Entrepreneurial Orientation has a positive and significant effect on Business Performance with a t-statistic of 3.831 and p-value of 0.000, so this hypothesis is accepted. This study's results align with a previous study that stated entrepreneurial orientation positively and significantly influences business performance. (Munawar et al., 2023). Product Innovation significantly affects Business Performance with a t-statistic of 4.159 and a p-value of 0.000, which indicates that the hypothesis is accepted. This study's results align with a previous study that stated Business Performance was positively and significantly influenced by Product Innovation (Munawar et al., 2023). Then, Entrepreneurial Orientation significantly affects Digitalization, as it has a t-statistic of 4.349 and a p-value of

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0.000, so this hypothesis is accepted. This study's results align with a previous study that stated Entrepreneurial Orientation positively and significantly influenced Digitalization. (S. Kraus et al., 2023). Product Innovation significantly affects Digitalization, as it has a t-statistic of 7.512 and a p-value of 0.000, so this hypothesis is accepted. This study's findings are consistent with prior research, which found that Product Innovation has a favourable and substantial effect on Digitalization. (S. Kraus et al., 2023). Finally, this hypothesis is accepted with a T-statistic of 5.563 and a P-value of 0.000. The findings of this study are consistent with previous research that found that Digitalization had a positive and significant impact on Business Performance. (Indana & Indartono, 2020). The findings show that Entrepreneurial Orientation and Product Innovation have an important impact on Business Performance, with Digitalization as an intervening variable.

4.9. Indirect Effect Test

The specific indirect effect was tested to examine the mediating relationships between variables in the model. Using the bootstrapping procedure, this testing was also performed to obtain t-statistics and p-values for each indirect path. An indirect effect is considered significant if the p-value is less than 0.05 or the t-statistic exceeds 1.96, indicating that the mediating variable is meaningful in the relationship between the independent and dependent variables. The analysis was conducted using SmartPLS 3 with 500 bootstrap subsamples, which is deemed adequate to ensure the stability and reliability of the indirect effect estimates. (Safitri & Komaryatin, 2025).

Table 9. Specific Indirect Effect

	Hypothesis	Original Sample	T-statistic	P-value	Information
Entrepreneurial Orientation→Digitalization→Business Performance	H6	0.134	3.185	0.001	Significant
Product Innovation→Digitalization→Business Performance	H7	0.230	4.443	0.000	Significant

Source: (SmartPLS, 2025)

Based on Table 9, the hypothesis test result shows that Digitalization mediates the relationship between Entrepreneurial Orientation and Business Performance, with a T-statistic of 3.185, effect of 0.134, and P-value of 0.001. Same with the result of Hypothesis 7 test, the result shows that Digitalization mediates the relationship between Product Innovation and Business Performance, with a T-statistic of 4.443, effect of 0.230, and P-value of 0.000; these results align with the previous study that stated Product Innovation indirectly affects Business Performance positively and significantly (Taopik et al., 2024). All the hypotheses are accepted since the T-statistic >1.96 and the P-value <0.05. Thus, Digitalization significantly mediates the relationship. The following is the Specific Indirect Effect value.

4.10. Discussion

This study reveals that Entrepreneurial Orientation and Product Innovation have a positive and significant influence on Business Performance, both directly and through the mediation of intervening Digitalization. This shows that a strong Entrepreneurial Orientation and Product Innovation encourage the achievement of more optimal Business Performance, mainly when supported by the application of Digital Technology. The findings that Entrepreneurial Orientation has a significant effect on Business Performance (T-statistic= 3.831; P-Value= 0.000), the result shows that entrepreneurial spirit, such as risk-taking, proactivity, and innovation in business management, directly improves operational efficiency and business

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competitiveness. This is in line with a study by Wahyuni and Sara (2020) and Sawaean and Ali (2020), which found that Entrepreneurial Orientation improves the adaptability and performance of organizations in a dynamic business environment. The positive influence of Product Innovation on Business Performance (T-statistic= 4.159; P-value= 0.000) indicates that sustainable product development is one of the key factors in increasing customer satisfaction and added value for customers. This is in accordance with the findings from (Falahat et al., 2020) that Product Innovation integrated with services can extend the product life cycle and strengthen customer loyalty. In digitalization, the study shows that digitalization significantly mediates the relationship between entrepreneurial orientation, product innovation, and business performance. Digitalization strongly influences Business Performance (T-statistic= 5.563; P-value= 0.000), emphasizing Digitalization, such as information systems, e-commerce platforms, and business process automation, which provides high efficiency and adaptability in a rapidly changing digital market. In addition, the high R-square value for Business Performance (0.740) and Digitalization (0.668) indicates that the research model has excellent predictive power. A Q-square value of 0.453 indicates that the model can account for 45.3% of the data variability, indicating the model's moderate structural relevance.

Nevertheless, it is important to note that although Digitalization has a significant impact as an intervening variable, its success remains highly dependent on human resource support, technological readiness, and the proper implementation strategy. This means that Digitalization is not a single solution but a catalyst that must be integrated with the overall entrepreneurial and product innovation strategy. These findings strengthen the integrative approach between Digitalization, Product Innovation, and Entrepreneurial Orientation to improve Business Performance, especially in the era of competitive digital transformation.

V. Conclusion

This study shows that Entrepreneurial Orientation and Product Innovation have a positive and significant influence on Business Performance, directly and through the intervening variable of Digitalization. These findings indicate that Entrepreneurial Orientation and Product Innovation are important in improving Business Performance. In addition, digitalization has been proven to play a key role as an intervening variable, strengthening the influence of entrepreneurial orientation and product innovation on business performance.

However, although Digitalization has an important role as a mediator/intervening in the result of this study, it also emphasizes that the success of improving Business Performance depends not only on the use of that digital technology, but also on innovative strategies and entrepreneurial spirit accompanying it. Therefore, integrating Entrepreneurial Orientation, Product Innovation, and Digitalization is an important combination to create sustainable competitiveness in the current digital transformation era. This study also shows that the structural model used has predictive power, with R-square and Q-square values indicating that the variables in the model can explain most of the variability of the observed data. Although this research makes significant theoretical and practical contributions, some limitations must be noted. First, a limited sample count and only focusing on a specific region context can affect the generalization of findings. Second, the quantitative approach has not been able to capture the dynamics of individual behavior and the more complex organizational context deeply.

Therefore, for future researchers who are interested in studying similar topics, it is recommended to conduct further research with a broader sample scope and diverse industry sectors so that the results can be generalized more widely, and then combine quantitative and qualitative approaches to delve deeper into experiences, motivations, and obstacles in the implementation of Digitalization and Product Innovation. The next researcher is expected to be able to explore the role of factors other than entrepreneurial orientation, such as organizational culture, customer experience, or market orientation, as intervening or moderating variables in the influence of Entrepreneurial Orientation on Business Performance, and finally, examine the long-term effect of digitalization on customer loyalty, business sustainability, and adaptability to market changes. Thus, further research can provide a more comprehensive and applicable understanding of efforts to develop businesses based on innovation and digitalization in a sustainable manner.

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