Digital Innovation Capability and Customer Value Co-Creation on New Product Performance with Digital Transformation Maturity as a Moderating Variable in Trading Companies in Indonesia

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ABSTRACT

This study investigates how digital innovation capability and customer value co-creation influence the performance of new products, with digital transformation maturity serving as a moderating variable. Novelty in this research is the development of indicators, especially on the variable of co-creation of customer value. In this quantitative research, data will be collected using a structured questionnaire, employing a 6-point Likert scale. The data will be analyzed using Structural Equation Modeling (SEM) to examine the relationships between variables and test the proposed hypotheses. The sample size will be a minimum of 230 respondents. The findings confirm that Digital Innovation Capability and Customer Value Co-Creation positively influence New Product Performance. However, Digital Transformation Maturity does not strengthen these relationships, suggesting that high levels of digital maturity may introduce rigidity, reduce human-led innovation, and shift focus towards efficiency rather than customer engagement. Future studies should compare different industries (manufacturing, services, technology) to explore whether digital transformation maturity has varying effects on product performance. Future research should track the long-term impact of digital innovation and customer co-creation on new product success over multiple years.

INTRODUCTION

In today's dynamic business environment, the rapid evolution of digital technologies has significantly reshaped the competitive landscape for trading companies. These technologies have enabled businesses to innovate faster, enhance customer experiences, and deliver greater value. In Indonesia, where trading companies form a critical component of the economy, digital transformation has become a strategic imperative to sustain growth and remain competitive. However, the integration of digital capabilities into product innovation remains a challenge, especially in achieving consistent performance in new product launches (Renaldo et al., 2024).

The performance of new products has become a critical determinant of organizational success, particularly in an era characterized by rapid technological advancements and shifting consumer expectations (Rosário et al., 2024). Despite the increasing emphasis on innovation, many companies struggle to achieve consistent success with their new product launches. Global statistics reveal that approximately 30-40% of new products fail to meet their performance targets, even in well-established markets.

In Indonesia, trading companies face unique challenges that can hinder the performance of new products. For instance, the country's diverse consumer base, characterized by varying purchasing power and digital literacy, requires businesses to adopt localized and innovative approaches to product development (Nyoto et al., 2023).

However, many companies lack the digital capabilities to align product features with consumer preferences effectively. This disconnect often results in products that fail to resonate with target markets, leading to low adoption rates and financial losses.

Furthermore, the pressure to innovate quickly to stay ahead of competitors often results in inadequate product testing and customer feedback integration during the development process. For instance, in the fast-moving consumer goods (FMCG) sector, new product launches often fail to achieve their intended sales targets due to a mismatch between product attributes and consumer needs, despite heavy investments in marketing and promotions.

Digital Innovation Capability, the ability to leverage digital technologies to create and improve products, services (Junaedi et al., 2024), and processes, has emerged as a key driver of competitive advantage (Xu et al., 2024). Trading companies with robust digital innovation capabilities can identify and respond to market needs more effectively, thereby improving their ability to launch successful new products. However, these capabilities alone may not guarantee success; customer value co-creation plays a vital role in aligning innovations with customer expectations. Through active collaboration with customers, trading companies can better understand consumer needs, refine product offerings, and foster stronger market acceptance for new products.

Despite the apparent benefits, the success of digital innovation and customer value co-creation efforts often depends on the company's Digital Transformation Maturity, the extent to which digital technologies are integrated across organizational processes, culture (Junaedi et al., 2023), and strategy (Vărzaru & Bocean, 2024). Companies with higher digital transformation maturity are better positioned to harness the synergies between innovation and customer collaboration, thereby enhancing the performance of new products.

While prior research has explored the individual impacts of digital innovation capability and customer value co-creation, the moderating role of digital transformation maturity in this context remains underexplored, particularly in the Indonesian trading sector. This study addresses this gap by investigating how digital innovation capability and customer value co-creation influence the performance of new products, with digital transformation maturity serving as a moderating variable.

The findings of this study are expected to provide actionable insights for trading companies in Indonesia, enabling them to better utilize digital technologies, foster customer collaboration, and enhance the performance of new product launches. Furthermore, this research contributes to the academic literature by elucidating the interplay between digital innovation, customer value co-creation, and digital transformation maturity in a dynamic and fast-evolving business environment. Novelty in this research is the development of indicators, especially on the variable of co-creation of customer value.

LITERATURE REVIEW

Resource-Based View (RBV)

Organizations achieve competitive advantage and superior performance by effectively utilizing their unique resources and capabilities (Lutfi et al., 2022). Digital Transformation Maturity reflects how effectively a company integrates resources to enhance innovation and product outcomes.

Dynamic Capability Theory (DTC)

Firms achieve competitive advantage in dynamic environments by building, integrating, and reconfiguring internal and external competencies to address changing environments (Michael & Olayide, 2024). Digital Innovation Capability reflects a firm's ability to adapt and innovate in response to technological changes.

Stakeholder Theory

Organizations must manage and align the interests of various stakeholders to achieve sustainable success (Suhardjo et al., 2024). Customer Value Co-Creation directly involves customers as key stakeholders in the product development process.

New Product Performance

New Product Performance It refers to the degree to which a newly launched product meets its intended goals in terms of market success, customer acceptance, and contribution to the firm's financial and strategic objectives.

Indicators (Hamdani et al., 2022):

• Sales Growth: The percentage increase in sales attributed to the new product.

- Market Share: The product's share in its target market segment.

- Customer Satisfaction: The extent to which the product meets or exceeds customer expectations.

- Time to Market: The speed at which the product is developed and launched.

- Return on Investment (ROI): The financial returns generated by the new product relative to its costs.

Digital Transformation Maturity

Digital transformation maturity represents the extent to which an organization has successfully integrated digital technologies into its operations, culture, and strategy to improve performance and competitiveness.

Indicators (Teichert, 2019):

- Technology Integration: The level of adoption of digital tools and platforms.

- Process Automation: The extent to which processes are automated using digital technologies.

- Data-Driven Decision-Making: The use of analytics and data insights to guide decisions.

- Cultural Readiness: The degree of employee engagement and acceptance of digital initiatives.

- Digital Strategy Alignment: The alignment of digital transformation goals with overall business objectives.

Digital Innovation Capability

Digital innovation capability is the organization's ability to leverage digital technologies to create, develop, and implement new ideas, products, or services that provide value to customers and competitive advantage to the firm.

Indicators (Kroh et al., 2024):

- Idea Generation: The capacity to develop innovative ideas using digital tools.

- Technology Utilization: The effective use of digital technologies in innovation processes.

- R&D Activities: Investment and focus on research and development related to digital solutions.

- Cross-Functional Collaboration: Collaboration across departments for digital innovation.

- Speed of Innovation: The agility of the organization in bringing new digital innovations to market.

Customer Value Co-Creation

Customer value co-creation is the collaborative process in which customers actively participate in the creation of products or services by sharing insights, feedback, and preferences to deliver mutually beneficial outcomes.

Indicators (Yi & Gong, 2013):

- Customer Involvement: The extent of customer participation in the product development process.

- Feedback Integration: The use of customer feedback to shape product features and design.

- Joint Problem Solving: Collaboration with customers to address specific needs and challenges.

- Knowledge Sharing: Exchange of information and ideas between the company and customers.

- Customer Satisfaction with Collaboration: Customers' perceived value and satisfaction with the co-creation process.

Hypothesis

H1: Digital Innovation Capability improves New Product Performance

H2: Customer Value Co-creation improves New Product Performance

H3: Digital Transformation Maturity strengthen the improvement of Digital Innovation Capability to New Product Performance

H4: Digital Transformation Maturity strengthen the improvement of Customer Value Co-creation to New Product Performance
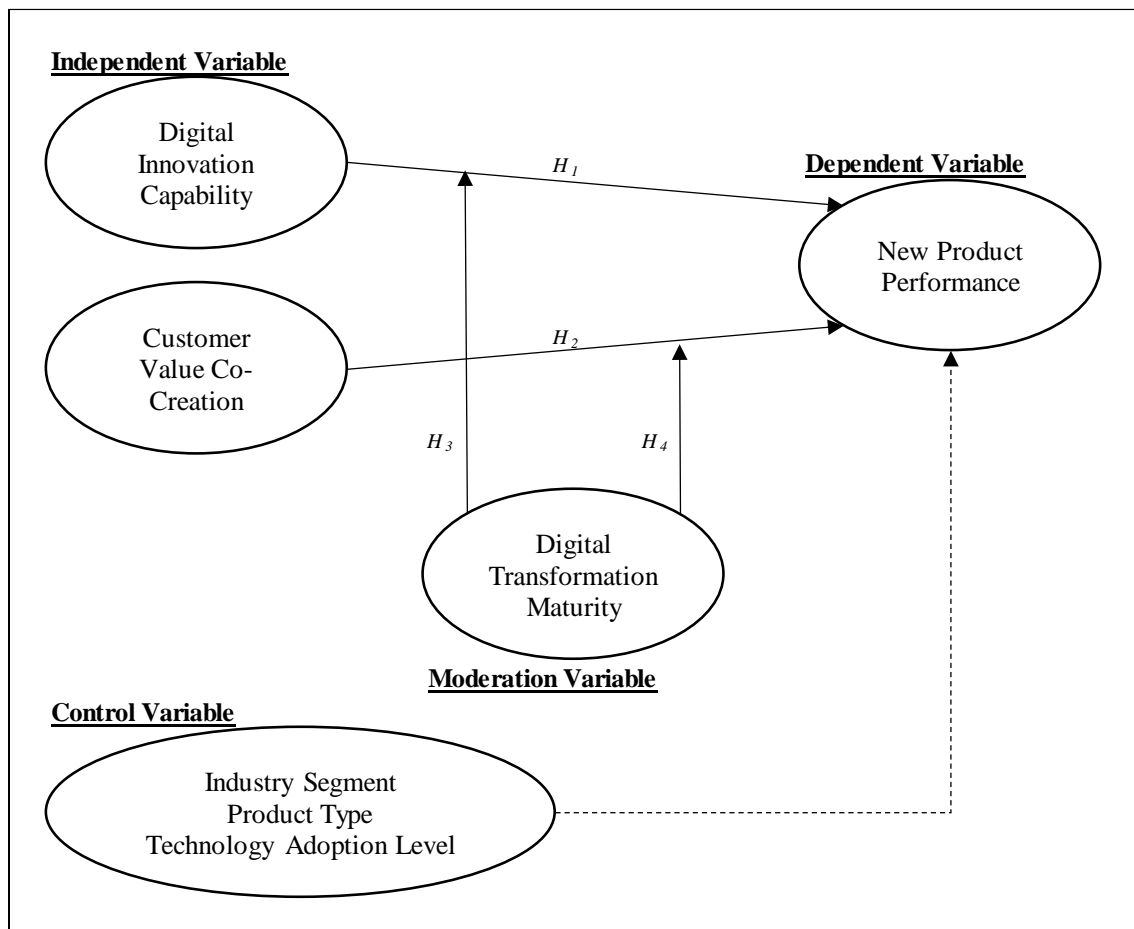
Research Framework

Figure 1. Research Framework

METHODOLOGY

Research Design

This quantitative study will collect data using a structured questionnaire with a 6-point Likert scale (1 = Strongly Disagree to 6 = Strongly Agree) (Sekaran & Bougie, 2016). The analysis will include descriptive statistics to summarize data characteristics, validity and reliability tests to ensure measurement accuracy, and Structural Equation Modeling (SEM) to examine variable relationships and test hypotheses (Bakhroini et al., 2022). These methods will provide insights into data patterns, supporting a thorough investigation of the research questions (Gazali et al., 2022).

Population and Sample

This study focuses on companies in Indonesia engaged in trading. This study will employ purposive sampling, selecting participants based on relevant characteristics. A minimum of 230 respondents will be included, following SEM guidelines that recommend at least 10 times the number of dimensions in the questionnaire (20 dimensions and 3 control variables) for reliability (Hair et al., 2019). This approach ensures a suitable and sufficient sample for hypothesis testing and analyzing variable relationships.

Variable Operationalizations

The operationalization of the variables can be seen in Appendix 1. For control variable, this study use industry segment, product type, and technology adoption level. Industry segment was measured by nominal scale: 1, 2, and 3 which are Wholesale, Retail, or E-commerce. Product type was measured by nominal scale: 1, 2, and 3 which are Physical, Digital, or Hybrid. Technology adoption level was measured by ordinal scale: 1, 2, and 3 which are low, middle, and high.

Descriptive Statistics

Descriptive statistics will summarize the demographic and operational characteristics of respondents and companies (Lind et al., 2018). Company profiles will detail industry type, size, and years of operation, while respondent profiles will include job title, experience, and education to contextualize their relevance. Key variables will be analyzed using statistical measures such as mean, median, mode, standard deviation, and range, providing insights into data distribution and variability. These analyses will enhance the understanding of dataset patterns and variable relationships.

Validity and Reliability Test

The study will assess validity using the outer loadings test, where values above 0.6 confirm an adequate sample size, and the average variance extracted (AVE) must exceed 0.5 to ensure strong factor representation. Reliability will be tested using Cronbach's Alpha, with a threshold of 0.7 or higher indicating consistent measurement within each scale. Discriminant validity will also be evaluated, requiring all values to remain below 0.8. These measures will enhance the reliability and validity of the study's measurement instruments, ensuring robust results (Sukmawaty et al., 2021).

Multicollinearity Test

The multicollinearity test evaluates the correlation between independent variables to ensure model reliability. A well-structured model is indicated by a VIF value below 10, allowing for further analysis if this criterion is met (Yenni et al., 2024).

Model Test

This analysis measures the proportion of variance in the dependent variable explained by the independent variables. A higher R^2 value indicates stronger explanatory power, serving as the first model assessment. The second test, the f-square test, determines the effect size of independent variables, with higher values indicating a greater impact. Lastly, predictive relevance (Q^2) is evaluated using a specific formula to assess the model's ability to predict outcomes (Hafni et al., 2024):

$$Q^2 = 1 - (1 - R_1^2)(1 - R_2^2) \dots (1 - R_n^2)$$

Predictive relevance is evaluated using the blindfolding procedure to assess the quality of observation values based on the Q^2 value. If $Q^2 > 0$, the observation value is considered good, whereas if $Q^2 < 0$, it is deemed poor. In structural models, Q^2 measures how well the model generates predicted values and estimates its parameters. A Q^2 value greater than 0 signifies strong predictive relevance, while a Q^2 value of 0 or less indicates weak predictive relevance. A higher Q^2 value suggests stronger predictive capability. Ideally, all three model tests should yield high values.

Structural Equation Modeling Analysis

This study utilizes Structural Equation Modeling (SEM) with SMART PLS to analyze the effects of independent, intervening, and control variables on the dependent variable (Purwati et al., 2023). The structural equations derived from the analysis are as follows:

New Product Performance = a_1 Digital Innovation Capability + a_2 Customer Value Co-Creation + a_3 Digital Transformation Maturity + a_4 Digital Transformation Maturity * Digital Innovation Capability + a_5 Digital Transformation Maturity * Customer Value Co-Creation + a_6 Industry Segment + a_7 Product Type + a_8 Technology Adoption Level + e

Hypothesis Testing

Path coefficients (β) in SEM are used to assess the direct relationships between variables. A p-value of less than 0.05 indicates a significant relationship. Standardized coefficients (β) help determine the strength and direction of these relationships (Chandra et al., 2023).

ANOVA Test

ANOVA (Analysis of Variance) is a statistical technique used to test the difference in means between two or more sample groups (Renaldo, Suhardjo, et al., 2023; Renaldo, Vomizon, et al., 2023; Suhardjo et al., 2023). This test is useful in research to determine whether there is a significant difference in a variable based on a particular category or group. The group separated by Industry Segment, Product Type, and Technology Adoption Level.

RESULTS AND DISCUSSION

Results

Table 1. Descriptive Statistics (Metric Type and No Missings)

Name	No.	Mean	Median	Mode	Observed & Scale min	Observed & Scale max	Standard deviation	Excess kurtosis	Skewness	Cramér-von Mises p value
Y1	1	4.035	4	4	2	6	0.995	-0.771	0.063	0
Y2	2	4.039	4	3	2	6	0.971	-0.952	0.065	0
Y3	3	4.030	4	4	2	6	0.948	-0.775	-0.092	0
Y4	4	4.004	4	3	2	6	0.976	-0.795	0.274	0
Y5	5	4.009	4	4	2	6	0.932	-0.738	0.047	0
X1.1	6	4.078	4	4	2	6	0.851	-0.949	-0.023	0
X1.2	7	4.000	4	4	2	6	0.752	-0.731	0.062	0
X1.3	8	4.043	4	4	2	6	0.796	-1.033	-0.026	0
X1.4	9	4.126	4	4	3	6	0.773	-0.852	0.006	0
X1.5	10	4.013	4	4	2	6	0.897	-0.716	0.302	0
X2.1	11	3.983	4	4	3	6	0.818	-0.896	0.272	0
X2.2	12	4.035	4	4	2	6	0.818	-1.014	-0.161	0
X2.3	13	4.030	4	4	2	6	0.846	-0.780	-0.058	0
X2.4	14	4.061	4	4	2	6	0.800	-0.684	-0.008	0
X2.5	15	4.043	4	4	2	6	0.801	-0.547	-0.028	0
Z1	16	4.022	4	4	2	6	0.852	-0.705	-0.169	0
Z2	17	4.083	4	4	3	6	0.873	-0.992	0.193	0
Z3	18	4.087	4	4	2	6	0.814	-0.589	0.034	0
Z4	19	4.009	4	4	2	6	0.813	-0.520	0.082	0
Z5	20	4.009	4	4	2	6	0.791	-0.595	0.091	0
C1	21	1.987	2	1	1	3	0.821	-1.522	0.024	0
C2	22	2.039	2	3	1	3	0.815	-1.496	-0.072	0
C3	23	1.891	2	2	1	3	0.781	-1.341	0.193	0

Source: Processed data, 2025

Descriptive statistical analysis indicates that new product performance, digital innovation capability, customer value co-creation, and digital transformation maturity, measured using a 6-point Likert scale, demonstrate favorable results. Additionally, the most common industry segment (mode) is wholesale (1), the predominant product type is hybrid (3), and the prevailing technology adoption level is middle (2).

Validity and Reliability Test

Table 2. Outer Loadings Output

	Outer loadings
X1.1 <- Digital Innovation Capability	0.831
X1.2 <- Digital Innovation Capability	0.814
X1.3 <- Digital Innovation Capability	0.833
X1.4 <- Digital Innovation Capability	0.833
X1.5 <- Digital Innovation Capability	0.854
X2.1 <- Customer Value Co-creation	0.840
X2.2 <- Customer Value Co-creation	0.829
X2.3 <- Customer Value Co-creation	0.839
X2.4 <- Customer Value Co-creation	0.830
X2.5 <- Customer Value Co-creation	0.815
Y1 <- New Product Performance	0.766
Y2 <- New Product Performance	0.739
Y3 <- New Product Performance	0.722
Y4 <- New Product Performance	0.760
Y5 <- New Product Performance	0.740
Z1 <- Digital Transformation Maturity	0.848
Z2 <- Digital Transformation Maturity	0.850
Z3 <- Digital Transformation Maturity	0.825
Z4 <- Digital Transformation Maturity	0.838
Z5 <- Digital Transformation Maturity	0.820
Digital Transformation Maturity x Digital Innovation Capability -> Digital Transformation Maturity x Digital Innovation Capability	1.000
Digital Transformation Maturity x Customer Value Co-creation ->	1.000

	Outer loadings
Digital Transformation Maturity x Customer Value Co-creation	
C1 <- Industry Segment	1.000
C2 <- Product Type	1.000
C3 <- Technology Adoption Level	1.000

Source: Processed data, 2024

The results of the outer loadings test show that all values exceed 0.7, indicating that all indicators are valid and suitable for further analysis.

Table 3. Construct Reliability and Validity Output

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Customer Value Co-creation	0.888	0.888	0.918	0.690
Digital Innovation Capability	0.890	0.890	0.919	0.694
Digital Transformation Maturity	0.892	0.893	0.921	0.699
New Product Performance	0.800	0.801	0.862	0.556

Source: Processed data, 2024

The analysis results indicate that all reliability criteria exceed 0.7, and the AVE values are above 0.5. This confirms that the requirements have been met, allowing the analysis to proceed to the next stage.

Table 4. Discriminant Validity Output

	Customer Value Co-creation	Digital Innovation Capability	Digital Transformation Maturity	Industry Segment	New Product Performance	Product Type	Technology Adoption Level
Customer Value Co-creation	0.831						
Digital Innovation Capability	0.905	0.833					
Digital Transformation Maturity	0.891	0.879	0.836				
Industry Segment	-0.021	-0.042	-0.046	1.000			
New Product Performance	0.913	0.918	0.911	-0.024	0.746		
Product Type	-0.008	-0.015	-0.038	-0.090	-0.009	1.000	
Technology Adoption Level	-0.027	-0.033	-0.009	-0.111	-0.029	0.082	1.000

Source: Processed data, 2024

The analysis results show that all discriminant validity test values are below 0.8, indicating that the requirements for discriminant validity have been met, allowing the analysis to proceed to the next stage.

Multicollinearity Test

Table 5. Multicollinearity Test Output

	VIF
Digital Innovation Capability -> New Product Performance	6.519
Customer Value Co-creation -> New Product Performance	7.306
Digital Transformation Maturity -> New Product Performance	5.716
Digital Transformation Maturity x Customer Value Co-creation -> New Product Performance	8.554
Digital Transformation Maturity x Digital Innovation Capability -> New Product Performance	8.563
Industry Segment -> New Product Performance	1.030
Product Type -> New Product Performance	1.020
Technology Adoption Level -> New Product Performance	1.024

Source: Processed data, 2024

The test results indicate that all VIF values are below 10, confirming that the research model is free from multicollinearity issues and can proceed to the next stage of analysis.

Model Test

Table 6. Coefficient Determination Test Output

	R-square	R-square adjusted
New Product Performance	0.901	0.898

Source: Processed data, 2024

The test results for new product performance show an adjusted R-square value of 0.898. This indicates that digital innovation capability, customer value co-creation, the moderating effect of digital transformation

maturity, industry segment, product type, and technology adoption level collectively explain 89.8% of the variance in new product performance, with the remaining 10.2% influenced by other factors.

Table 7. f-square Test Output

	f-square
Digital Innovation Capability -> New Product Performance	0.208
Customer Value Co-creation -> New Product Performance	0.104
Digital Transformation Maturity -> New Product Performance	0.211
Digital Transformation Maturity x Customer Value Co-creation -> New Product Performance	0.000
Digital Transformation Maturity x Digital Innovation Capability -> New Product Performance	0.000
Industry Segment -> New Product Performance	0.002
Product Type -> New Product Performance	0.002
Technology Adoption Level -> New Product Performance	0.000

Source: Processed data, 2024

The results of the f-square test show that the majority of values are high, indicating that most independent variables have a strong influence on New Product Performance.

The predictive relevance (Q^2) is calculated using the following formula and computations:

$$Q^2 = 1 - (1 - 0.901) = 0.901$$

This indicates that the model in this study has strong predictive relevance, as it can explain 90.1% of the information in the research data.

Structural Equation Modeling Analysis

Table 8. Structural Equation Modeling Output

	Hypothesis	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values (1-tailed)	Result
Digital Innovation Capability -> New Product Performance	+	0.366	0.367	0.051	7.113	0.000	Accepted
Customer Value Co-creation -> New Product Performance	+	0.275	0.274	0.059	4.677	0.000	Accepted
Digital Transformation Maturity -> New Product Performance		0.345	0.345	0.052	6.609	0.000	
Digital Transformation Maturity x Digital Innovation Capability -> New Product Performance	+	0.001	0.002	0.057	0.013	0.495	Rejected
Digital Transformation Maturity x Customer Value Co-creation -> New Product Performance	+	0.004	0.003	0.055	0.080	0.469	Rejected
Industry Segment -> New Product Performance		0.014	0.014	0.020	0.721	0.236	
Product Type -> New Product Performance		0.013	0.012	0.022	0.594	0.277	
Technology Adoption Level -> New Product Performance		-0.006	-0.006	0.021	0.281	0.389	

Source: Processed data, 2024

The SEM test results indicate that all variables positively impact new product performance. The structural equations derived from the analysis are as follows:

New Product Performance = 0.366 Digital Innovation Capability + 0.275 Customer Value Co-Creation + 0.345 Digital Transformation Maturity + 0.001 Digital Transformation Maturity * Digital Innovation Capability + 0.004 Digital Transformation Maturity * Customer Value Co-Creation + 0.014 Industry Segment + 0.013 Product Type – 0.006 Technology Adoption Level + e_1

Hypothesis Testing

The one-tailed SEM test results reveal that certain hypotheses are supported, while others are not. The specific details are as follows:

H1: Digital Innovation Capability improves New Product Performance, accepted in 1%

H2: Customer Value Co-creation improves New Product Performance, accepted in 1%

H3: Digital Transformation Maturity strengthen the improvement of Digital Innovation Capability to New Product Performance, rejected

H4: Digital Transformation Maturity strengthen the improvement of Customer Value Co-creation to New Product Performance, rejected

ANOVA Test

Table 9. ANOVA Test Output

Indicator	Industry Segment	Product Type	Technology Adoption Level
Y1	1.160 (0.315)	0.324 (0.724)	4.320 (0.014)
Y2	1.286 (0.278)	0.814 (0.444)	0.441 (0.664)
Y3	0.548 (0.579)	1.028 (0.359)	1.215 (0.299)
Y4	0.716 (0.490)	0.284 (0.753)	1.092 (0.337)
Y5	0.672 (0.512)	0.079 (0.924)	0.339 (0.713)
X1.1	1.071 (0.344)	0.895 (0.410)	0.623 (0.537)
X1.2	0.923 (0.399)	0.290 (0.749)	0.613 (0.542)
X1.3	1.475 (0.231)	0.472 (0.624)	0.205 (0.815)
X1.4	0.278 (0.757)	0.455 (0.635)	0.435 (0.648)
X1.5	0.342 (0.711)	0.192 (0.826)	0.707 (0.494)
X2.1	1.100 (0.335)	0.711 (0.492)	0.100 (0.905)
X2.2	1.474 (0.231)	0.658 (0.519)	0.185 (0.831)
X2.3	1.039 (0.356)	0.511 (0.601)	1.361 (0.258)
X2.4	1.063 (0.347)	1.594 (0.205)	0.929 (0.397)
X2.5	1.646 (0.195)	0.117 (0.890)	0.722 (0.487)
Z1	0.718 (0.489)	0.536 (0.586)	0.304 (0.738)
Z2	1.947 (0.145)	1.729 (0.180)	2.644 (0.073)
Z3	0.947 (0.389)	0.943 (0.391)	1.281 (0.280)
Z4	2.307 (0.102)	0.743 (0.477)	0.014 (0.986)
Z5	1.648 (0.195)	0.627 (0.535)	1.107 (0.332)

Source: Processed data, 2024

Based on ANOVA test, it can be seen that only a few indicators have significant results. While overall for one variable it still does not provide a significant difference. This indicates that the industry segment, product type, and technology adoption level in this trading company still cannot provide a significant difference.

Discussion

Digital Innovation Capability improves New Product Performance

The relationship between Digital Innovation Capability (DIC) and New Product Performance (NPP) is well-supported by strategic management and innovation theories. Digital innovation capability enables firms to effectively utilize digital technologies, optimize processes, and foster creativity, leading to successful new product development and higher market performance.

RBV suggests that firms achieve competitive advantage and superior performance by leveraging valuable, rare, inimitable, and non-substitutable (VRIN) resources. Digital innovation capability is a strategic resource that enables firms to create differentiated and high-performing products. Digital innovation capability includes advanced technologies, data analytics, AI-driven design, and cloud computing, which help companies optimize product development. A firm with strong digital innovation capabilities can differentiate its products from competitors, reduce costs, and accelerate time-to-market, ultimately improving product performance.

Digital Capabilities Theory states that firms must continuously develop, adapt, and integrate their resources in response to rapidly changing environments. Digital innovation capability represents a firm's ability to transform and reconfigure its resources to drive new product success. Digital innovation capability enhances a firm's ability to sense opportunities, seize technological advancements, and reconfigure resources to develop competitive products. Firms with higher digital innovation capabilities can adjust to consumer trends, integrate customer feedback, and personalize products, leading to better new product performance.

Stakeholder theory emphasizes that firms must balance the interests of multiple stakeholders, including customers, employees, suppliers, and investors. Digital innovation capability helps firms meet stakeholder expectations by delivering high-quality, innovative products (Mukhsin et al., 2023). Digital innovation allows

firms to engage customers in co-creation, ensuring that new products align with their preferences. It also enhances operational efficiency, improving supplier relationships and reducing production costs.

Customer Value Co-creation improves New Product Performance

The relationship between Customer Value Co-Creation (CVCC) and New Product Performance (NPP) is widely supported by strategic management and innovation theories. Engaging customers in the value creation process allows firms to develop products that better meet market needs, leading to higher adoption rates, improved customer satisfaction, and competitive advantage (Renaldo, 2024).

RBV suggests that a firm's competitive advantage comes from unique, valuable, and inimitable resources. Customer Value Co-Creation (CVCC) acts as an intangible asset that enhances firms' ability to develop successful new products. Customers provide first-hand insights, preferences, and feedback, allowing firms to design products that align with market demand. CVCC strengthens a firm's brand differentiation, making new products more attractive.

DCT emphasizes that firms must sense, seize, and reconfigure their resources to remain competitive. CVCC enhances a firm's ability to adapt to changing customer needs, leading to superior product performance. Firms that involve customers in co-creation sense emerging trends and seize new market opportunities. Companies can reconfigure their resources dynamically to develop products that better match evolving customer preferences.

Stakeholder Theory states that firms must balance the interests of multiple stakeholders, including customers, suppliers, and investors. Customer Value Co-Creation enhances stakeholder engagement, leading to improved New Product Performance. Involving customers in co-creation ensures that products align with their needs, increasing adoption rates. Customers become brand advocates, reducing marketing costs and increasing product success.

Digital Transformation Maturity strengthen the improvement of Digital Innovation Capability to New Product Performance

Digital Transformation Maturity is often seen as a facilitator for innovation, it may not necessarily strengthen the relationship between Digital Innovation Capability (DIC) and New Product Performance. According to RBV, firms gain competitive advantage from valuable, rare, and inimitable resources. However, as digital transformation reaches maturity, its incremental impact on innovation may decline. Firms with already high DIC do not benefit significantly from additional digital transformation, as they have already optimized their technological and innovative capabilities.

DCT suggests that firms must sense, seize, and reconfigure resources to stay competitive. However, excessive digital maturity can lead to bureaucratic complexity and rigid processes, slowing down innovation. When DTM is too high, firms may focus on standardization and automation rather than the flexibility and experimentation needed for breakthrough innovations.

Stakeholder Theory emphasizes balancing the interests of different stakeholders. When firms reach high digital maturity, they may prioritize operational efficiency, cost-cutting, and compliance over innovation. Firms with high DTM may divert focus from customer-driven innovation to digital infrastructure maintenance, reducing the impact of DIC on New Product Performance.

Studies suggest that excessive reliance on digital infrastructure can make firms less agile and responsive to market changes. In trading companies, digital transformation often focuses on supply chain optimization, data analytics, and automation, rather than new product innovation. Unlike technology firms, trading companies do not necessarily need high DTM to translate DIC into New Product Performance. While DTM is essential for digital business operations, its role as a moderator in driving product innovation is not always positive, particularly in industries like trading, where operational efficiency often takes precedence over innovation.

Digital Transformation Maturity strengthen the improvement of Customer Value Co-creation to New Product Performance

RBV suggests that competitive advantage comes from unique and valuable resources. However, as firms reach higher digital maturity, they often standardize processes rather than fostering unique, personalized customer experiences. While digital transformation provides tools for customer engagement, it can also lead to automated and impersonal interactions, reducing the depth of co-creation. Many companies implement AI-powered customer service systems, but these often replace meaningful human interactions, reducing the effectiveness of CVCC in driving product innovation.

DCT emphasizes a firm's ability to sense, seize, and reconfigure resources for competitive advantage. However, excessive digital maturity can make organizations rigid and slow in adapting to rapidly changing customer needs. Firms with high digital transformation maturity may rely too much on pre-set algorithms, automated systems, and data analytics, making them less responsive to real-time customer feedback and spontaneous innovation opportunities. A company using an AI-driven design system might ignore qualitative customer insights that cannot be easily quantified, limiting the benefits of CVCC in new product development.

Stakeholder Theory highlights the importance of balancing interests among various stakeholders, including customers. However, firms with high DTM often prioritize shareholders and operational efficiency over deep customer engagement. High digital maturity can lead firms to focus on data-driven decision-making (Renaldo et al., 2022) rather than human-centric co-creation, reducing the value of direct customer involvement in new product success. Many digitally mature companies use big data analytics to predict customer preferences rather than engaging customers in hands-on product development, leading to lower co-creation effectiveness.

Research indicates that companies over-relying on digital platforms for customer feedback may lose the personal touch necessary for effective co-creation. Social media sentiment analysis provides general insights but lacks the depth of real co-creation workshops or direct customer collaboration in R&D. In trading companies, digital transformation often focuses on e-commerce, automation, and supply chain efficiency rather than deep customer involvement in product design. Unlike industries such as software development or luxury goods, where customer input is critical, trading companies may not see significant gains from integrating high digital transformation maturity into the co-creation process. While DTM enables digital interactions, it can also lead to standardization, automation, and reduced flexibility, which weakens the role of customer value co-creation (CVCC) in driving new product performance (NPP).

Industry Segment, Product Type, and Technology Adoption Level on New Product Performance

Industry Segment (Wholesale, Retail, or E-commerce), Product Type (Physical, Digital, Hybrid), and Technology Adoption Level (Low, Middle, High) can not improve New Product Performance. RBV suggests that a firm's success is determined by its unique internal resources and capabilities, rather than the industry in which it operates. A company's ability to develop and launch a successful product depends more on innovation, market strategy, and customer engagement than whether it operates in wholesale, retail, or e-commerce. As example, Apple (Retail) and Dell (E-commerce and B2B), both companies successfully introduce new products despite different industry segments because their product innovation strategies drive success. Nike (Retail & E-commerce) and Alibaba's Private Labels (Wholesale & E-Commerce), both launch successful products through strong branding and innovation, not industry type. DCT argues that firms must sense, seize, and reconfigure resources to remain competitive. Companies that can quickly adapt to market trends and customer needs will succeed, regardless of whether they operate in wholesale, retail, or e-commerce. Amazon (E-Commerce) and Walmart (Retail & Wholesale), both companies succeed in new product launches by leveraging customer data and adaptive strategies, not because of their industry segment.

Stakeholder Theory emphasizes that companies must align their products with customer needs, rather than focusing on the nature of the product itself (physical, digital, or hybrid). The success of a new product is not dependent on whether it is physical, digital, or hybrid, but rather on how well it meets market demand and delivers customer value. Netflix (Digital Product) and Tesla (Physical Product), both companies dominate their markets because of strong value creation and customer engagement, not because of product type. Microsoft Office (Digital) vs. iPad (Physical & Hybrid), both achieve strong NPP due to innovation and continuous improvement, not because of their product type. DCT suggests that firms must continually evolve their offerings to remain competitive. Whether a product is digital, physical, or hybrid is less important than a firm's ability to improve and adapt based on customer needs. Adobe (Software/Digital) transitioned to a subscription model and improved performance despite staying digital. Apple's shift from iPods (Physical) to Apple Music (Hybrid Digital-Physical) shows that business model adaptation matters more than product type.

RBV suggests that technology adoption alone does not create a competitive advantage unless combined with strategic capabilities. High technology adoption does not automatically guarantee product success, what matters is how technology is utilized. Spotify (Medium Tech Adoption) and Google Stadia (High Tech Adoption), Spotify succeeded by focusing on market demand, while Stadia failed despite using advanced cloud gaming technology. Tesla (High Tech) and Mazda (Low Tech in EV Segment), Tesla leveraged innovation, while Mazda, despite slower EV adoption, still performs well due to strong brand equity and product-market fit. DCT highlights that firms must use technology to enhance agility rather than focusing on the absolute level of adoption. A company with low or medium technology adoption can still outperform a high-tech company if it better understands customer needs and market dynamics. Zara (Low-Medium Tech Adoption) and Amazon Fashion (High Tech Adoption), Zara's fast fashion agility outperforms Amazon's AI-driven fashion recommendations because Zara adapts faster to consumer trends. High-tech adoption does not always align with customer needs.

Companies must focus on whether technology enhances customer experience, rather than just increasing adoption. BlackBerry and Apple, BlackBerry initially had higher security and business-oriented technology, but Apple's focus on user experience and app ecosystem led to greater new product success.

CONCLUSION

Conclusion

The findings confirm that Digital Innovation Capability and Customer Value Co-Creation positively influence New Product Performance. However, Digital Transformation Maturity does not strengthen these relationships, suggesting that high levels of digital maturity may introduce rigidity, reduce human-led innovation, and shift focus towards efficiency rather than customer engagement.

Implications

Theoretical Implications. Supports Resource-Based View (RBV) by highlighting that Digital Innovation Capability (DIC) is a critical firm resource that enhances new product success. Aligns with Dynamic Capability Theory (DCT) by demonstrating that organizations need flexibility in adapting customer inputs and digital transformation efforts to maximize product innovation. Challenges the Stakeholder Theory perspective by showing that excessive digitalization might reduce customer-driven innovation, particularly in trading companies.

Managerial Implications. For innovation managers, organizations should balance digital maturity with human-centered co-creation strategies, ensuring that automation does not replace direct customer collaboration. For digital transformation leaders, firms should adopt adaptive digital strategies that enhance agility, rather than rigid systems that limit real-time customer input in new product development. For trading companies, digital transformation should be tailored to improve customer interaction rather than focusing solely on operational efficiency to maximize co-creation benefits.

Limitations

The study focuses on trading companies, which may limit generalizability to manufacturing or service industries with different digital adoption patterns. The study captures data at a single point in time, which limits the ability to analyze long-term effects of digital transformation on innovation outcomes. The research primarily uses quantitative data, which might not fully capture nuanced human interactions in customer co-creation processes.

Recommendations

Companies should strategically integrate digital transformation to enhance human-led innovation rather than relying solely on automation and predictive analytics. Hybrid digital strategies that combine AI-driven insights with direct customer collaboration should be implemented to strengthen co-creation efforts. Organizations must continuously evaluate their digital maturity levels, ensuring that digital investments support rather than hinder new product innovation.

Future Research

Future studies should compare different industries (manufacturing, services, technology) to explore whether digital transformation maturity has varying effects on product performance. Future research should track the long-term impact of digital innovation and customer co-creation on new product success over multiple years. In-depth case studies or interviews with industry leaders could provide richer insights into how digital transformation maturity affects customer interactions in product development. Exploring other moderating factors, such as organizational agility or leadership digital competency, could provide a deeper understanding of what strengthens the link between co-creation and product success.

REFERENCES

Bakhroini, Junaedi, A. T., & Putra, R. (2022). Motivation, Work Culture, Commitment, and Leadership Style on Job Satisfaction and Employee Performance in Pekerjaan Umum dan Penataan Ruang (PUPR) Services in Kampar District. *Journal of Applied Business and Technology*, *3*(1), 86–101.

Chandra, S., Tianto, A., Veronica, V., Ng, M., & David, D. (2023). The Influence of Products, Prices, Promotions, and Places on Purchase Decisions at PT. Arta Agrindo Subur Pratama Pekanbaru. *Proceeding of International Conference on Business Management and Accounting (ICOBIMA)*, *2*(1), 257–270. https://doi.org/https://doi.org/10.35145/icobima.v2i1.4084

Gazali, D., Panjaitan, H. P., & Chandra, T. (2022). Competence, Motivation, and Organizational Commitment on Job Satisfaction and Employee Performance at Bank Sinarmas Pekanbaru Riau Branch. *Journal of Applied Business and Technology*, *3*(1), 26–39.

Hafni, L., Anita, A., Vanesa, S., Safari, S., & Tjahjana, D. J. S. (2024). An Exploration of the Relationship between Leadership, Motivation, Environment, and Performance in Small and Medium Food Distribution Enterprises. *Journal of Applied Business and Technology*, *5*(2), 105–115. https://doi.org/https://doi.org/10.35145/jabt.v5i2.167

Hair, J. F. H., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate Data Analysis* (Eighth). Cengage. https://doi.org/10.1002/9781119409137.ch4

Hamdani, N. A., Ridwan, M., Maulani, G. A. F., & Permana, I. (2022). Analysis of Intervening Variables of New Product Performance affected by Tacit Knowledge and Strategic Flexibility. *Mix: Jurnal Ilmiah Manajemen*, *12*(3), 368–383. https://doi.org/10.22441/jurnal_mix.2022.v12i3.002

Junaedi, A. T., Renaldo, N., Yovita, I., Veronica, K., & Sudarno. (2023). Digital Culture as a Moderating Factor in Increasing Digital Literacy. *Reflection: Education and Pedagogical Insights*, *1*(3), 116–127. http://firstcierapublisher.com/index.php/reflection/article/view/49

Junaedi, A. T., Wijaya, F. W., Panjaitan, H. P., Yovita, I., & Renaldo, N. (2024). TRUST, SECURITY, CONVENIENCE, QUALITY OF SERVICE AND PRICE ON ONLINE PURCHASE DECISIONS IN PT. YANMARINDO PERKASA. *Procuratio: Jurnal Ilmiah Manajemen*, *12*(2), 169–184.

Kroh, J., Globocnik, D., Schultz, C., Holdhof, F., & Salomo, S. (2024). Micro-foundations of digital innovation capability – A mixed method approach to develop and validate a multi-dimensional measurement instrument. *Technological Forecasting and Social Change*, *198*(122942), 1–16. https://doi.org/10.1016/j.techfore.2023.122942

Lind, D. A., Marchal, W. G., & Wathen, S. A. (2018). Statistical Techniques in Business & Economics. In *Economics* (17th ed.). McGraw-Hill Education.

Lutfi, A., Alkelani, S. N., Al-Khasawneh, M. A., Alshira'h, A. F., Alshirah, M. H., Almaiah, M. A., Alrawad, M., Alsyouf, A., Saad, M., & Ibrahim, N. (2022). Influence of Digital Accounting System Usage on SMEs Performance: The Moderating Effect of COVID-19. *Sustainability*, *14*(15048), 1–23. https://doi.org/10.3390/su142215048

Michael, A. O., & Olayide, A. O. (2024). Leveraging Technology for Strategic Competitive Advantage. *Tuijin Jishu / Journal of Propulsion Technology*, *45*(2), 5922–5935. https://fastercapital.com/startup-topic/Leveraging-Technology-for-Competitive-Advantage.html

Mukhsin, M., Renaldo, N., Junaedi, A. T., Veronica, K., & Cecilia, C. (2023). Innovative Approaches to Cloud-Based Accounting Information Systems: Integrating AI, Blockchain, and IoT. *Proceeding of International Conference on Business Management and Accounting (ICOBIMA)*, *2*(1), 288–294. https://doi.org/https://doi.org/10.35145/icobima.v2i1.4375

Nyoto, Renaldo, N., & Effendi, I. (2023). SWOT Analysis of Economic Impact Development of Potential Kuantan Singingi Pacu Jalur Tourism Development. *The Seybold Report*, *18*(02), 1342–1349. https://doi.org/10.17605/OSF.IO/T58CF

Purwati, A. A., Hamzah, Z., Hamzah, M. L., & Deli, M. M. (2023). Digital and Entrepreneurial Literacy in Increasing Students' Entrepreneurial Interest in the Technological Era. *Proceeding of International Conference on Business Management and Accounting (ICOBIMA)*, *2*(1), 34–43. https://doi.org/https://doi.org/10.35145/icobima.v2i1.3498

Renaldo, N. (2024). Digital and Sustainable Accounting for Corporate Value Creation. *Nexus Synergy: A Business Perspective*, *2*(1), 46–55. https://doi.org/https://doi.org/10.61230/nexus.v2i1.97

Renaldo, N., Jollyta, D., Suhardjo, Fransisca, L., & Rosyadi, M. (2022). Pengaruh Fungsi Sistem Intelijen Bisnis terhadap Manfaat Sistem Pendukung Keputusan dan Organisasi. *Jurnal Informatika Kaputama*, *6*(3), 61–78.

Renaldo, N., Murwaningsari, E., & S, Y. A. (2024). Examining the Moderating Effect of a Novel Green Strategy Model on Innovation, Information Systems and Business Performance. *Journal of System and Management Sciences*, *14*(12), 300–326. https://doi.org/10.33168/jsms.2024.1218

Renaldo, N., Suhardjo, Andi, Sevendy, T., & Purnama, I. (2023). Improving Accounting Students' Statistical Understanding of 2-Way ANOVA Through a Case Study of Indonesian Coffee Exports. *Reflection:*

Education and Pedagogical Insights, *1*(1), 13–19. https://firstcierapublisher.com/index.php/reflection/article/view/4

Renaldo, N., Vomizon, R., Nuonnad, D. O., Okšav, N., & Hilas, R. A. (2023). The Use of ANOVA in Comparative Analysis of Exchange Rates in Indonesia. *Nexus Synergy: A Business Perspective*, *1*(2), 100–108. http://firstcierapublisher.com/index.php/nexus/article/view/47

Rosário, C., Varum, C., & Botelho, A. (2024). Unlocking the Code to Continuous Innovation: A Study of Key Determinants for Serial Innovators. *Administrative Sciences*, *14*(3), 1–16. https://doi.org/10.3390/admsci14030045

Sekaran, U., & Bougie, R. (2016). *Research Method for Business A Skill-Building Approach Seventh Edition* (Seventh Ed). John Wiley & Sons. https://doi.org/10.1007/978-94-007-0753-5_102084

Suhardjo, Renaldo, N., Sevendy, T., Rusgowanto, F. H., & Pramesti, I. G. A. A. (2023). Chi-Square and 2-Way ANOVA for Accounting Students: Analysis of Natural Gas Sales Volume by Pipeline by Customer Type in Indonesia. *Reflection: Education and Pedagogical Insights*, *1*(1), 34–39. https://firstcierapublisher.com/index.php/reflection/article/view/7

Suhardjo, S., Junaedi, A. T., Andi, A., Putri, N. Y., Renaldo, N., Musa, S., & Cecilia, C. (2024). Social Accounting in Sustainability Reporting for Digital Banking. *Nexus Synergy: A Business Perspective*, *2*(1), 36–45. https://doi.org/https://doi.org/10.61230/nexus.v2i1.96

Sukmawaty, D., Sudarno, & Putra, R. (2021). Work Motivation, Discipline, and Work Culture on Work Satisfaction and Teacher Performance at State Junior High School, Sukajadi District. *Journal of Applied Business and Technology*, *2*(3), 251–260.

Teichert, R. (2019). Digital Transformation Maturity: A Systematic Review of Literature. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, *67*(6), 1673–1687. https://doi.org/10.11118/actaun201967061673

Vărzaru, A. A., & Bocean, C. G. (2024). Digital Transformation and Innovation: The Influence of Digital Technologies on Turnover from Innovation Activities and Types of Innovation. *Systems*, *12*(359), 1–25. https://www.mdpi.com/2079-8954/12/9/359

Xu, M., Zhang, Y., Sun, H., Tang, Y., & Li, J. (2024). How digital transformation enhances corporate innovation performance: The mediating roles of big data capabilities and organizational agility. *Heliyon*, *10*(14), e34905. https://doi.org/10.1016/j.heliyon.2024.e34905

Yenni, E., Junaedi, A. T., & Wijaya, E. (2024). The Impact of Government Accounting Standards Implementation, Internal Control Systems, and Human Resource Competence on Regional Financial. *Journal of Applied Business and Technology*, *5*(3), 134–145. https://doi.org/https://doi.org/10.35145/jabt.v5i3.182

Yi, Y., & Gong, T. (2013). Customer value co-creation behavior: Scale development and validation. *Journal of Business Research*, *66*(9), 1279–1284. https://doi.org/10.1016/j.jbusres.2012.02.026

APPENDIX

Variable	Dimension	Indicator	Source
New Product Performance	Sales Growth	The percentage increase in sales attributed to the new product	Developed from (Hamdani et al., 2022)
	Market Share	The product's share in its target market segment	
	Customer Satisfaction	The extent to which the product meets or exceeds customer expectations	
	Time to Market	The speed at which the product is developed and launched	
	Return on Investment (ROI)	The financial returns generated by the new product relative to its costs	
Digital Innovation	Idea Generation	The capacity to develop innovative ideas using digital tools	Developed from

Variable	Dimension	Indicator	Source
Capability	Technology Utilization	The effective use of digital technologies in innovation processes	(Kroh et al., 2024)
	R&D Activities	Investment and focus on research and development related to digital solutions	
	Cross-Functional Collaboration	Collaboration across departments for digital innovation	
	Speed of Innovation	The agility of the organization in bringing new digital innovations to market	
Customer Value Co-creation	Customer Involvement	The extent of customer participation in the product development process	(Yi & Gong, 2013)
	Feedback Integration	The use of customer feedback to shape product features and design	
	Joint Problem Solving	Collaboration with customers to address specific needs and challenges	
	Knowledge Sharing	Exchange of information and ideas between the company and customers	Novelty
	Customer Satisfaction with Collaboration	Customers' perceived value and satisfaction with the co-creation process	
Digital Transformation Maturity	Technology Integration	The level of adoption of digital tools and platforms	
	Process Automation	The extent to which processes are automated using digital technologies	
	Data-Driven Decision-Making	The use of analytics and data insights to guide decisions	Developed from (Teichert, 2019)
	Cultural Readiness	The degree of employee engagement and acceptance of digital initiatives	
	Digital Strategy Alignment	The alignment of digital transformation goals with overall business objectives	