# 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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# 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. The data will be analyzed using Structural Equation Modeling (SEM) to examine the relationships between variables and test the proposed hypotheses. 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.

Keywords: Digital Innovation Capability; New Product Performance

## 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). 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.

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 (Jamaedi et al., 2023), and strategy (Warzaru & 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.

## LITERATURE REVIEW

### Resource-Based View (RBV)

Organizations achieve competitive advantage and superior performance by effectively utilizing their unique resources and capabilities (Latifi 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 (Saturdjo 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**

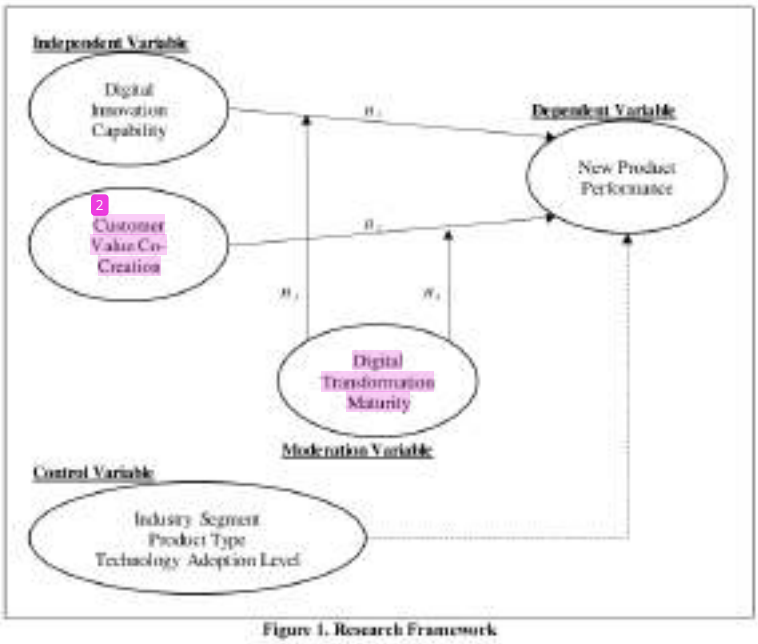


**Figure 1. Research Framework**

## METHODOLOGY

### Research Design

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 (Ghazali 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**

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**

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**

A well-structured model is indicated by a VIF value below 10, allowing for further analysis if this criterion is met (Yeoni 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):

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

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**

The structural equations derived from the analysis are as follows:

New Product Performance = $a_0$ Digital Innovation Capability + $a_1$ Customer Value Co-Creation + $a_2$ Digital Transformation Maturity + $a_3$ Digital Transformation Maturity * Digital Innovation Capability + $a_4$ Digital Transformation Maturity * Customer Value Co-Creation + $a_5$ Industry Segment + $a_6$ Product Type + $a_7$ 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 (Rosaldo, Suhardjo, et al., 2023; Rosaldo, Vorniceo, 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 | 0.965 | -0.771 | -0.063 | 0 |
| Y2 | 2 | 4.039 | 4 | 5 | 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 | 4.006 | 4 | 5 | 2 | 6 | 0.936 | -0.795 | -0.234 | 0 |
| Y5 | 5 | 4.009 | 4 | 4 | 2 | 6 | 0.937 | -0.778 | -0.047 | 0 |
| X1.1 | 6 | 4.076 | 4 | 4 | 2 | 6 | 0.951 | -0.849 | -0.023 | 0 |
| X1.2 | 7 | 4.000 | 4 | 4 | 2 | 6 | 0.782 | -0.751 | -0.062 | 0 |
| X1.3 | 8 | 4.045 | 4 | 4 | 2 | 6 | 0.799 | -1.053 | -0.026 | 0 |
| X1.4 | 9 | 4.126 | 4 | 4 | 3 | 6 | 0.773 | -0.852 | 0.008 | 0 |
| X1.5 | 10 | 4.015 | 4 | 4 | 2 | 6 | 0.897 | -0.716 | 0.502 | 0 |
| X2.1 | 11 | 3.885 | 4 | 4 | 3 | 6 | 0.818 | -0.866 | 0.272 | 0 |
| X2.2 | 12 | 4.035 | 4 | 4 | 2 | 6 | 0.858 | -1.014 | -0.161 | 0 |
| X2.3 | 13 | 4.030 | 4 | 4 | 2 | 6 | 0.846 | -0.788 | -0.058 | 0 |
| X2.4 | 14 | 4.061 | 4 | 4 | 2 | 6 | 0.880 | -0.894 | -0.008 | 0 |
| X2.5 | 15 | 4.045 | 4 | 4 | 2 | 6 | 0.801 | -0.947 | -0.028 | 0 |
| Z1 | 16 | 4.022 | 4 | 4 | 2 | 6 | 0.852 | -0.765 | -0.169 | 0 |
| Z2 | 17 | 4.085 | 4 | 4 | 3 | 6 | 0.673 | -0.892 | 0.150 | 0 |
| Z3 | 18 | 4.087 | 4 | 4 | 2 | 6 | 0.834 | -0.589 | 0.054 | 0 |
| Z4 | 19 | 4.009 | 4 | 4 | 2 | 6 | 0.813 | -0.529 | 0.082 | 0 |
| Z5 | 20 | 4.009 | 4 | 4 | 2 | 6 | 0.781 | -0.669 | 0.091 | 0 |
| C1 | 21 | 1.987 | 2 | 1 | 1 | 3 | 0.821 | -1.522 | 0.028 | 0 |
| C2 | 22 | 2.039 | 2 | 2 | 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 |

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

*Source: Processed data, 2024*

**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 | 0.908 | 0.888 | 0.918 | 0.690 |
| Digital Innovation Capability | 0.890 | 0.890 | 0.919 | 0.694 |
| Digital Transformation Maturity | 0.892 | 0.895 | 0.921 | 0.699 |
| New Product Performance | 0.800 | 0.801 | 0.862 | 0.556 |

*Source: Processed data, 2024*

**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 | 0.903 | 0.833 | | | | | |
| Digital Transformation Maturity | 0.901 | 0.879 | 0.836 | | | | |
| Industry Segment | -0.027 | 0.042 | -0.046 | 1.000 | | | |
| New Product Performance | 0.913 | 0.918 | 0.911 | -0.024 | 0.746 | | |
| Product Type | -0.008 | 0.035 | -0.036 | -0.000 | -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*

**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*

**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 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:

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

**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 | 4.657 | 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 | 0.005 | 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 | 0.586 | 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 + $e_i$

**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) | 0.338 (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 (0.075) |
| 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 high 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 DT 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.

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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 Capability | Idea Generation | The capacity to develop innovative ideas using digital tools | Developed from (Kmih et al., 2024) |
| | 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 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 | Developed from (Teichert, 2019) |
| | 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 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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