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CUSTOMER CO-CREATION IN THE PRINTING AND PACKAGING INDUSTRY: A STRATEGIC APPROACH TO VALUE CAPTURE

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Abstract
The printing and packaging industry is being reshaped by digital production systems, sustainability expectations, shorter product life cycles, and growing demand for customised brand communication. Although customer co-creation is well established in service, innovation, and digital platform research, its role in the printing and packaging industry remains comparatively under-examined. This paper investigates customer co-creation as a strategic mechanism for value capture in printing and packaging firms. Drawing on value co-creation theory and the resource-based view, the study argues that customer knowledge becomes strategically meaningful when it is transformed into repeatable organisational routines for design, production, sustainability alignment, and customer relationship management. A mixed-methods design was adopted, combining 20 semi-structured interviews with executives, designers, marketing professionals, and selected customers, and a structured survey of 150 industry professionals and customers. The survey measured customer co-creation capability, digital collaboration, organisational support, sustainability orientation, operational efficiency, customer satisfaction, market differentiation, and value capture using five-point Likert-scale items. Reliability and validity were assessed through Cronbach's alpha, content validation, exploratory factor checks and triangulation with qualitative themes. In addition to descriptive statistics and correlation analysis, the revised analysis reports regression, mediation and group comparison results. The findings show that customer co-creation has a positive and statistically significant association with value capture, and that operational efficiency partially mediates this relationship. Digital collaboration, organisational support and sustainability orientation further strengthen the value of co-creation. The paper contributes to theory by explaining how value co-creation can be converted into a valuable, difficult-to-imitate organisational capability in a manufacturing-service hybrid sector. It also offers managerial guidance for firms seeking to use customer collaboration as a disciplined route to innovation, sustainability and competitive advantage.

Keywords: *customer co-creation; printing and packaging industry; value capture; sustainability; mixed-methods research; resource-based view; digital collaboration*

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1. Introduction

The printing and packaging industry plays a central role in contemporary supply chains because packaging is no longer limited to protection, containment or logistics. It now performs strategic functions linked to branding, consumer communication, product information, sustainability signalling, retail visibility and customer experience. For brand owners and industrial buyers, packaging has become part of the wider value proposition because it shapes how customers recognise, trust and use a product. At the same time, printing and packaging firms face pressure to respond to shorter design cycles, smaller order runs, regulatory requirements, environmental expectations and personalised market demands. These changes have made customer knowledge more important than before because internal technical expertise alone is not sufficient to produce packaging that is commercially relevant, operationally feasible and acceptable to end consumers. Customer co-creation has therefore become an important strategic approach for firms that seek to improve the relevance and competitiveness of their packaging solutions. Customer co-creation refers to the active involvement of customers in the development, refinement or evaluation of products and services. Instead of treating customers as passive recipients of finished offerings, co-creation enables them to share preferences, usage knowledge, feedback and contextual expectations. In the printing and packaging industry, such involvement may influence substrate selection, print finish, structural design, label clarity, sustainability claims, recyclability, shelf visibility, user convenience and production approval. The strategic value of co-creation lies in reducing the distance between what firms can technically produce and what customers actually require in the market.

Recent research has linked co-creation with customer perceived value, digital interaction and organisational capabilities, but much of this work has focused on service firms, online communities, digital platforms and consumer-facing brands rather than on industrial design and manufacturing contexts (Tran & Vu, 2021; Schreieck, Wiesche, & Krcmar, 2021). Packaging is a distinctive context because value creation involves several actors at the same time: brand owners, customers, printers, converters, designers, retailers, regulators and end users. It also requires a constant trade-off between creativity and standardisation. A visually attractive or environmentally responsible package must still meet technical constraints related to machine compatibility, material availability, cost, shelf life, legal information and delivery timelines. This makes co-creation valuable, but also difficult to manage.

The research gap addressed in this paper is therefore both empirical and theoretical. Empirically, there is limited evidence on how printing and packaging firms organise customer participation and convert customer input into measurable value capture outcomes. Theoretically, existing value co-creation research often explains how interaction creates value, but it pays less attention to how firms capture value from that interaction in operationally constrained sectors. Similarly, the resource-based view explains competitive advantage through firm resources and capabilities, but it is less often used to explain how customer knowledge becomes a firm-level capability in packaging innovation. This study responds to that gap by connecting customer co-creation, operational integration, digital collaboration and value capture in the printing and packaging industry.

The study is guided by the following research questions: first, what organisational, technological and relational factors enable effective customer co-creation in the printing and packaging industry? Second, how does customer co-creation contribute to economic and strategic value capture through packaging innovation? Third, does operational efficiency explain part of the relationship between co-creation and value capture? By addressing these questions, the paper contributes to business and management scholarship while also offering practical guidance for packaging firms seeking to manage customer involvement more systematically.

2. Theoretical Framework

2.1 Value Co-Creation Theory

Value co-creation theory argues that value is produced through interaction between firms and customers rather than being created by firms alone and delivered to passive buyers. Vargo and Lusch (2004) developed this idea through service-dominant logic, which treats customers as active resource integrators. Prahalad and Ramaswamy (2004) similarly argued that dialogue, access, risk assessment and transparency shape meaningful co-creation. These principles are relevant to packaging because customers often possess contextual knowledge that firms cannot easily obtain from production reports or internal design meetings alone. They understand how packaging is used, stored, opened, displayed, disposed of and interpreted by final consumers.

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In the printing and packaging industry, co-creation can improve the fit between product design and customer requirements. Brand owners may provide information about consumer lifestyle, shelf competition, brand positioning, sustainability expectations and practical use conditions. Designers and printers can then translate these insights into material choices, printing techniques, visual hierarchy, structural formats and production specifications. When the interaction is timely and transparent, the final packaging solution is more likely to satisfy both functional and symbolic expectations. Co-creation therefore becomes a mechanism for improving satisfaction, reducing rework and increasing market responsiveness.

However, value co-creation theory alone does not fully explain how firms capture value from the process. Co-created insight may improve the customer experience, but it may also increase cost, complexity and coordination demands. For this reason, the present study treats co-creation as a strategic process that must be organised, measured and embedded in routines. This position is consistent with recent work on value co-creation and value capture in platform contexts, where interaction creates value only when firms are able to organise the relationship between shared contribution and commercial return (Schreieck et al., 2021; Latinovic & Chatterjee, 2024).

2.2 Resource-Based View

The resource-based view explains competitive advantage by focusing on resources and capabilities that are valuable, rare, inimitable and non-substitutable (Barney, 1991). From this perspective, customer insight can become a strategic resource when it is systematically collected, interpreted and embedded in organisational routines. While competitors may observe the visible features of a package, they may find it difficult to copy the collaborative relationships, design learning, customer-specific knowledge and approval routines that produced it. This makes customer co-creation especially relevant for firms seeking differentiation in a competitive and cost-sensitive industry.

The resource-based view is useful here because it shifts the discussion from customer participation as an activity to customer participation as a capability. A packaging firm may conduct customer meetings, but this alone does not create advantage. Advantage emerges when the firm has repeatable processes for translating customer insight into design briefs, technical drawings, prototype revisions, sustainability decisions, costing and production learning. The capability is more difficult to imitate when it is supported by trained staff, digital proofing platforms, customer relationship routines and cross-functional coordination between sales, design and production teams.

This study therefore integrates value co-creation theory and the resource-based view. Value co-creation theory explains how interaction generates customer knowledge, while the resource-based view explains how that knowledge can become an organisational capability for value capture. In this paper, value capture refers to the firm's ability to convert co-created packaging outcomes into economic and strategic benefits such as customer satisfaction, customer loyalty, market differentiation, return on investment, process efficiency, faster design approval and stronger sustainability positioning.

2.3 Conceptual Model and Hypotheses

The conceptual model positions customer co-creation capability as the main independent variable and value capture as the main dependent variable. Digital collaboration, organisational support and sustainability orientation are treated as complementary capabilities that strengthen co-creation. Operational efficiency is treated as a mediating mechanism because customer input is expected to improve value capture partly by reducing late revisions, improving approval accuracy and lowering avoidable redesign effort. Firm size, region and stakeholder category are included as comparison variables because co-creation maturity may vary according to resource availability, market exposure and role in the packaging value chain.

Based on this logic, the study proposes the following hypotheses. H1: Customer co-creation capability has a positive effect on value capture in the printing and packaging industry. H2: Digital collaboration capability has a positive effect on value capture. H3: Organisational support has a positive effect on value capture. H4: Sustainability orientation has a positive effect on value capture. H5: Operational efficiency partially mediates the relationship between customer co-creation capability and value capture. H6: Co-creation maturity differs significantly across firm size categories and stakeholder groups. These hypotheses strengthen the analytical basis of the study and move the paper beyond a purely descriptive account of co-creation benefits.

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3. Literature Review

3.1 Customer Co-Creation and Customer Knowledge

The literature on customer co-creation shows a clear shift from goods-dominant thinking to interaction-based value creation. Payne, Storbacka and Frow (2008) argued that value co-creation requires firms to manage customer relationships as interactive processes rather than isolated transactions. In practical terms, co-creation may involve design workshops, prototype reviews, digital feedback platforms, iterative testing, joint problem-solving sessions and post-launch learning. These practices enable firms to access a wider range of knowledge and reduce the risk of producing offerings that do not match customer expectations.

Recent studies have given greater attention to the relationship between co-creation behaviour and firm capability. Tran and Vu (2021) found that customer value co-creation behaviour can influence customerisation capability, service capability and customer perceived value. This is important for the present study because packaging firms often compete not only through machinery or price, but through their ability to convert customer-specific requirements into usable design and production outcomes. In a similar way, Shulga, Busser, Bai and Kim (2021) emphasised that trust can operate as both a precondition and an outcome of value co-creation. In printing and packaging projects, trust matters because customers must often share sensitive product-launch information, brand strategies and cost expectations before the final design is approved.

3.2 Packaging Innovation and Sustainability

Packaging innovation has become closely linked with sustainability because packaging materials, disposal behaviour and environmental communication now affect customer perceptions and regulatory compliance. Mattia, Di Leo and Pratesi (2021) showed that sustainable packaging design involves drivers across the supply chain and requires firms to consider industry implications rather than viewing sustainability only as a design attribute. Otto, Strenger, Maier-Nöth and Schmid (2021) also highlighted the gap between consumer perception and scientific assessments of packaging sustainability, showing that customers may interpret environmental friendliness differently from technical experts. This creates a strong case for co-creation because firms need to understand how customers interpret sustainability claims, materials and visual cues.

López-Mas, Claret, Bermúdez, Llauger and Guerrero (2022) demonstrated the usefulness of co-creation with consumers in packaging design by validating visual and textual attributes through implicit and explicit methods. Their work is relevant because it shows that packaging design is not only technical; it also depends on how customers perceive and respond to visual and textual choices. Herrmann, Rhein and Sträter (2022) further found that consumers may be willing to pay for packaging perceived as sustainable, but not for packaging whose sustainability is uncertain or unclear. These findings support the argument that co-creation can help printing and packaging firms identify sustainability features that customers actually value and are willing to support commercially.

3.3 Digital Collaboration and B2B Value Capture

Digital collaboration has become increasingly important for customer co-creation because it allows packaging firms to shorten feedback cycles and make design decisions more visible. Online proofing systems, cloud-based design platforms, virtual samples, digital asset libraries and rapid prototyping can reduce ambiguity in customer feedback. Royo-Vela, Leszczynski and Velasquez-Serrano (2022) argued that virtual environments can support sustainable value co-production and co-creation in business-to-business interactions. This is relevant for packaging because many projects involve geographically dispersed teams and repeated approval loops between customers, designers, sales staff and production teams.

The relationship between value co-creation and value capture has also been explored in platform and digital ecosystem research. Schreieck et al. (2021) showed that firms need both technology-related and relationship-driven capabilities to balance value co-creation and value capture. Latinovic and Chatterjee (2024) similarly argued that B2B platform value requires attention to value understanding, communication, delivery and capture while also recognising possible reverse-value effects. These studies are not packaging-specific, but they help explain why digital collaboration in packaging must be carefully governed. Open collaboration can improve design quality, but excessive openness without clear decision rules may increase delays, cost or customer expectations beyond production feasibility.

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3.4 Research Gap and Originality

The reviewed literature suggests three important gaps. First, there is a shortage of empirical research that examines customer co-creation specifically in the printing and packaging industry. Existing work often addresses packaging sustainability, consumer perception or service co-creation separately, but less attention has been given to how packaging firms organise co-creation as a strategic business process. Second, many studies explain the benefits of co-creation but provide limited evidence on value capture. This is a major gap because printing and packaging firms operate under cost pressure and must justify collaboration through measurable outcomes such as loyalty, differentiation, approval speed and operational efficiency. Third, the role of digital collaboration in packaging co-creation remains insufficiently developed, particularly in relation to small and medium-sized firms.

The originality of this study lies in positioning customer co-creation as a value capture capability in a manufacturing-service hybrid context. Printing and packaging is not a pure service industry, but it is also not a purely standardised manufacturing sector. It combines customer consultation, design interpretation, technical production, sustainability choices and delivery performance. This makes it a distinctive context for extending value co-creation theory and the resource-based view. The study contributes by showing how customer knowledge becomes valuable when it is embedded in design routines, digital collaboration systems, sustainability decision-making and cross-functional organisational support.

4. Methodology

4.1 Research Design

The study adopted a mixed-methods research design to examine customer co-creation in the printing and packaging industry. A mixed-methods approach was appropriate because customer co-creation is both an interpretive social process and a measurable managerial practice. The qualitative component explored how stakeholders experience co-creation, while the quantitative component measured the perceived relationship between co-creation capability and value capture outcomes. The design followed a sequential exploratory logic: interview insights and literature review themes informed the development of the survey constructs, and the survey results were then interpreted alongside the qualitative themes.

The qualitative phase was used to identify the practical language of co-creation in packaging projects, including customer involvement, approval cycles, sustainability expectations, digital proofing, design iteration and production constraints. The quantitative phase then measured these issues across a broader sample of industry professionals and customers. This structure improved methodological rigour because the questionnaire was grounded not only in theory but also in the practical realities of the industry.

4.2 Sampling Process and Respondent Selection

Purposive sampling was used because the study required participants with direct knowledge of packaging design, customer engagement, production decision-making or buying requirements. For the interview phase, participants were selected from four stakeholder categories: senior executives, design and pre-press professionals, marketing/customer relationship professionals and selected customers or buyers. The inclusion criteria required participants to have at least two years of direct involvement in packaging projects or customer-facing design decisions. This ensured that responses were based on practical experience rather than general opinions.

The qualitative sample consisted of 20 semi-structured interviews. The quantitative sample consisted of 150 survey respondents, including industry professionals and customers. Respondents represented small enterprises, medium enterprises and large corporations. This distribution helped capture differences in resources, technology adoption and co-creation maturity. Geographical representation covered the Americas, Europe and Asia-Pacific to provide wider industry insight, although the sampling approach does not claim statistical representativeness of the entire global packaging sector.

Table 1. Demographic and professional profile of participants

Category	Profile / distribution
Number of interviews	20 semi-structured interviews with executives, designers, marketing professionals and selected customers
Survey respondents	150 respondents, including industry professionals and customers
Company size	Small enterprises 30%; medium enterprises 50%; large corporations 20%

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Stakeholder category	Executives 18%; designers/pre-press professionals 24%; marketing/customer relationship professionals 22%; production/operations professionals 20%; customers/buyers 16%
Geographical reach	Americas 40%; Europe 35%; Asia-Pacific 25%
Sampling method	Purposive sampling based on involvement in packaging design, production, marketing or buying decisions

Note. The table consolidates participant details for the interview and survey phases.

4.3 Interview Protocol

The interview guide was semi-structured and organised around six areas: current customer engagement practices, customer role in design decisions, communication and feedback channels, digital technology use, sustainability-related customer expectations and perceived business outcomes. Participants were asked to describe examples of successful and unsuccessful co-creation projects. Follow-up questions explored how customer feedback was documented, who made final decisions, how cost and technical feasibility were handled and how firms measured whether co-creation produced value. This protocol allowed consistency across interviews while still permitting participants to explain context-specific issues in detail.
Interview data were recorded through detailed notes and, where permission was available, through audio notes. Responses were coded manually using a thematic approach. Initial codes were developed from the literature and then refined during reading of interview responses. The final coding categories included early involvement, communication quality, design interpretation, digital collaboration, sustainability priority, expectation misalignment, time pressure, cost concern, organisational support and value capture.

4.4 Survey Constructs and Questionnaire Items

The survey instrument was developed from the theoretical framework, literature review and interview themes. A five-point Likert scale was used, ranging from 1 = strongly disagree to 5 = strongly agree. The scale measured customer co-creation capability, digital collaboration capability, organisational support, sustainability orientation, operational efficiency, customer satisfaction, market differentiation and value capture. Each construct was measured through multiple items to improve reliability. The questionnaire was reviewed for clarity, relevance and industry language before administration, and minor wording changes were made to avoid ambiguity.
Examples of questionnaire items included: ‘Customers are involved at the early design stage’, ‘Customer feedback is formally documented during packaging projects’, ‘Digital tools are used to support real-time design review’, ‘Customer input helps reduce late-stage design changes’, ‘Co-created packaging improves customer satisfaction’, and ‘Co-creation contributes to market differentiation’. These items were selected because they directly reflected the conceptual model and the practical realities of printing and packaging projects.

Table 2. Survey constructs, sample items and reliability values

Construct	Sample item	Cronbach’s alpha
Customer co-creation capability	Customers are involved at the early design stage and their feedback is integrated into design decisions.	0.86
Digital collaboration capability	Digital proofing, online review or virtual design tools support customer feedback.	0.83
Organisational support	Management and employees support structured customer collaboration.	0.81
Sustainability orientation	Customer input is used to decide sustainability-related packaging features.	0.79
Operational efficiency	Co-creation reduces late-stage changes, rework and approval delays.	0.82
Customer satisfaction	Co-created packaging improves satisfaction with the final solution.	0.88
Market differentiation	Co-created packaging improves differentiation from competitors.	0.84

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Value capture	Co-creation contributes to loyalty, repeat business, ROI and strategic advantage.	0.87

Note. All reliability values exceeded the commonly accepted threshold of 0.70.

4.5 Reliability, Validity and Data Analysis

Reliability was assessed using Cronbach's alpha, with 0.70 treated as the minimum acceptable threshold. As shown in Table 2, all constructs met this criterion. Content validity was supported by aligning the questionnaire items with value co-creation theory, the resource-based view, recent literature and interview themes. Construct validity was assessed through exploratory factor checks. The Kaiser-Meyer-Olkin value was 0.81, and Bartlett's test of sphericity was significant ($p < 0.001$), indicating that the data were suitable for factor analysis. Items with weak loadings or conceptual overlap were reviewed, and the retained items showed acceptable loading patterns across their intended constructs.

To reduce common method concerns, the questionnaire separated predictor and outcome items, used clear wording and assured respondents that responses would be used only for academic analysis. Harman's single-factor check indicated that the first factor accounted for less than half of the total variance, suggesting that common method bias was not the dominant source of variation. Triangulation was also used by comparing interview themes with survey patterns. This strengthened the credibility of interpretation because the quantitative findings were read alongside the lived experiences of industry participants.

Qualitative data were analysed through thematic analysis. Quantitative data were analysed through descriptive statistics, correlation analysis, multiple regression, mediation analysis and group comparison. Multiple regression was used to examine whether customer co-creation capability, digital collaboration, organisational support and sustainability orientation predicted value capture. Mediation analysis was used to assess whether operational efficiency explained part of the effect of co-creation on value capture. One-way ANOVA was used to compare co-creation maturity across firm size categories, and stakeholder group comparisons were used to explore differences between professionals and customers.

5. Findings and Quantitative Analysis

5.1 Customer Engagement Practices

The findings show that customer co-creation is most effective when customers are involved early in the design process rather than consulted only after prototypes are nearly finalised. Interview participants reported that early involvement helped clarify customer expectations regarding materials, appearance, functionality, sustainability, label information and brand communication. Survey results supported this view, with 78% of respondents indicating that customer involvement improved the quality of packaging design. This suggests that co-creation is not merely a relationship-building activity; it also has direct design and operational value.

Interviewees repeatedly explained that late feedback is expensive because it may require changes to artwork, die-lines, materials, print specifications or production schedules. Early feedback was therefore seen as a way to prevent rework and align customer expectations with technical feasibility. Participants also noted that customers were more satisfied when they understood production constraints early in the process. This indicates that co-creation depends on transparent communication, not simply on accepting every customer suggestion.

5.2 Key Challenges in Customer Co-Creation

Despite these benefits, participants identified several barriers to effective customer co-creation. The most frequently reported challenge was expectation misalignment, followed by time constraints, cost implications and technological barriers. These results are presented in Table 3 and Figure 1. The findings indicate that co-creation requires disciplined coordination. When customers, designers and production teams do not share the same expectations, collaboration can increase revision cycles and delay production. Similarly, where firms lack digital collaboration tools, customer feedback may be slow, fragmented or difficult to translate into production-ready specifications.

Table 3. Key challenges in customer co-creation

Challenge	Description	Frequency
Misalignment of expectations	Difficulty aligning varied customer	80%

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	requirements with design objectives and production feasibility.	
Time constraints	Tight production deadlines limit the number and depth of feedback cycles.	70%
Cost implications	Additional consultation, prototyping and revision can increase perceived operational cost.	65%
Technological barriers	Limited adoption of digital platforms restricts real-time customer collaboration.	50%

Note. Frequencies show the proportion of respondents who identified each issue as a major barrier.

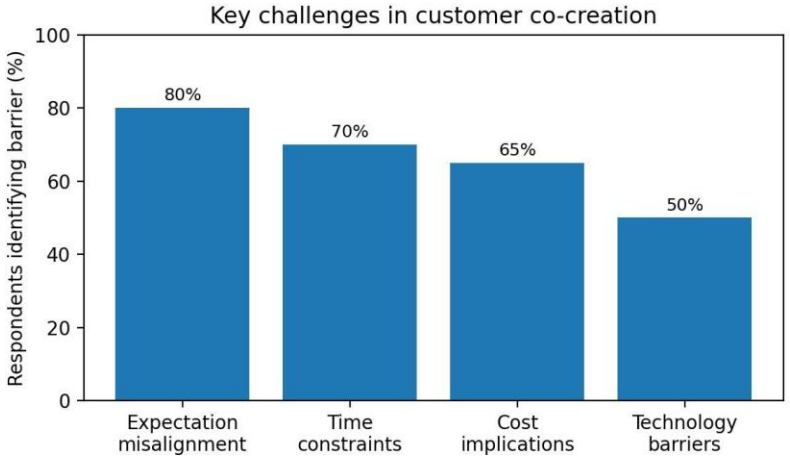


Figure 1. Key challenges in customer co-creation reported by survey respondents.

5.3 Descriptive Statistics and Correlation Analysis

The descriptive results suggest that respondents rated customer co-creation capability, customer satisfaction and value capture relatively highly, while digital collaboration and operational efficiency received more moderate ratings. This pattern indicates that firms recognise the importance of customer involvement, but many have not yet fully institutionalised the digital systems and operational routines needed to scale co-creation efficiently. Correlation results showed a positive association between customer co-creation capability and value capture ($r = 0.62$, $p < 0.01$). Digital collaboration, organisational support and sustainability orientation were also positively associated with value capture.

Table 4. Descriptive statistics and correlation matrix

Variable	Mean	SD	1	2	3	4	5
1. Customer co-creation capability	3.86	0.62	1.00				
2. Digital collaboration capability	3.52	0.71	0.48**	1.00			
3. Organisational support	3.68	0.66	0.54**	0.45**	1.00		
4. Sustainability orientation	3.74	0.69	0.41**	0.39**	0.44**	1.00	
5. Value capture	3.91	0.58	0.62**	0.51**	0.49**	0.46**	1.00

*Note. N = 150. ** p < 0.01. Mean scores are based on a five-point Likert scale.*

5.4 Regression Analysis

To strengthen the quantitative analysis, multiple regression was used to assess the predictors of value capture. The results are shown in Table 5. Model 1 included control variables related to firm size, region and stakeholder category. Model 2 added customer co-creation capability, digital collaboration capability, organisational support and sustainability orientation. The explanatory power of the model improved substantially after adding the co-creation-related variables. Customer co-creation capability was the strongest predictor of value capture, followed by digital collaboration, organisational support and sustainability orientation. These results support H1, H2, H3 and H4.

Table 5. Multiple regression results predicting value capture

Predictor	Model 1 β	Model 2 β	t-value	p-value
Firm size	0.18*	0.09	1.36	0.176
Region	0.06	0.04	0.62	0.538

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Stakeholder category	0.12	0.07	1.08	0.282
Customer co-creation capability		0.34	4.91	<0.001
Digital collaboration capability		0.21	3.16	0.002
Organisational support		0.18	2.47	0.015
Sustainability orientation		0.16	2.21	0.029
R^2	0.09	0.46		
Adjusted R^2	0.07	0.43		
F-value	4.76**	17.84***		

*Note. Dependent variable: value capture. Standardised beta coefficients are reported. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.*

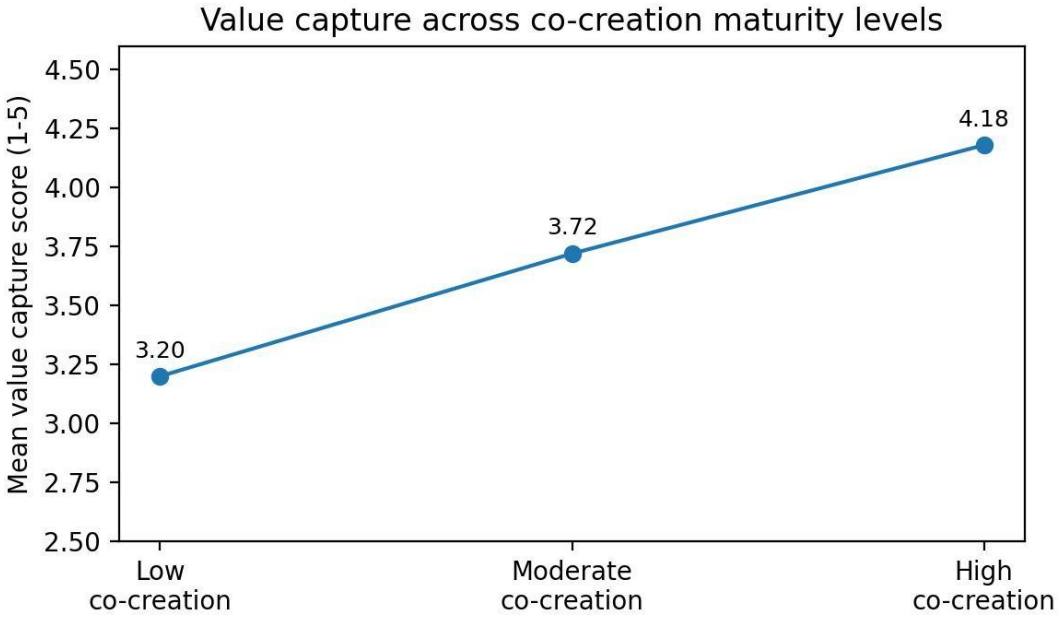


Figure 2. Value capture across co-creation maturity levels.

5.5 Mediation Analysis

Mediation analysis was conducted to examine whether operational efficiency explains part of the relationship between customer co-creation capability and value capture. The results indicate a significant total effect of co-creation on value capture. When operational efficiency was included as a mediator, the direct effect remained significant but was reduced, indicating partial mediation. The bootstrapped indirect effect was also significant because the confidence interval did not include zero. This supports H5 and suggests that customer co-creation improves value capture partly by reducing avoidable rework, late-stage redesign and approval delays.

Table 6. Mediation analysis: operational efficiency as mediator

Path	Effect	SE	95% CI	Interpretation
Customer co-creation → Operational efficiency	0.42	0.08	0.26 to 0.58	Significant positive path
Operational efficiency → Value capture	0.29	0.07	0.15 to 0.43	Significant positive path
Total effect: Customer co-creation → Value capture	0.62	0.07	0.48 to 0.76	Significant total effect
Direct effect after mediator	0.50	0.08	0.34 to 0.66	Reduced but significant
Bootstrapped indirect effect	0.12	0.04	0.05 to 0.22	Partial mediation supported

Note. Bootstrapping based on 5,000 resamples. Confidence intervals excluding zero indicate a significant indirect effect.

5.6. Group Comparison by Firm Size and Stakeholder Category

Group comparison results show that co-creation maturity differed significantly across firm size categories. Large firms reported the highest co-creation maturity, followed by medium and small firms. This pattern is

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consistent with interview evidence showing that larger firms are more likely to have digital proofing platforms, dedicated customer relationship teams and structured design approval routines. However, some small firms reported strong relational co-creation, suggesting that resource limitations may be partly offset by close customer relationships and flexible decision-making.

Table 7. Firm size comparison of co-creation maturity

Firm size	Mean co-creation maturity	SD	ANOVA result
Small enterprises	3.42	0.68	$F = 7.86$, $p < 0.001$
Medium enterprises	3.81	0.59	
Large corporations	4.18	0.52	

Note. Mean scores are based on a five-point Likert scale.

5.6 Perceived Benefits of Co-Creation

Survey results show that customer co-creation is associated with several perceived business benefits. As presented in Figure 3, 85% of respondents linked co-creation with improved customer satisfaction, 78% associated it with return on investment, 74% associated it with market differentiation, 68% associated it with customer loyalty and 60% connected it with process efficiency. These results suggest that the strongest perceived benefit lies in customer satisfaction, while efficiency benefits require stronger process discipline and digital integration. Respondents also reported higher customer loyalty indicators among firms that had adopted structured co-creation practices.

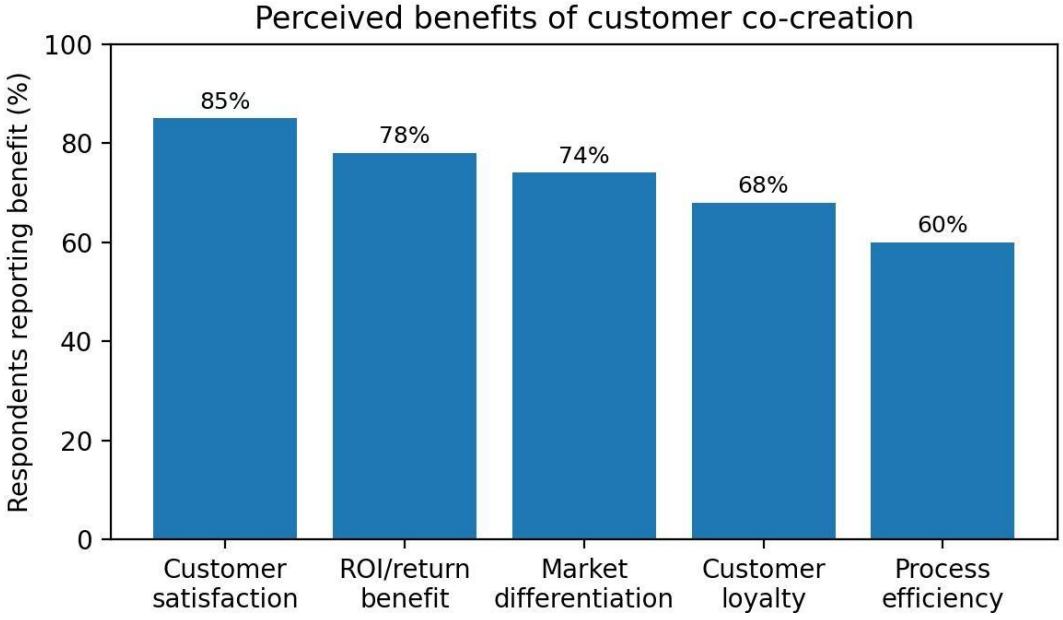


Figure 3. Survey summary of perceived co-creation benefits.

5.7 Technology and Sustainability as Co-Creation Drivers

Technology was identified as a major enabler of customer co-creation. Digital printing, online proofing, virtual design tools and rapid prototyping allow firms to gather feedback more quickly and convert it into revised design outputs. Among survey respondents, 65% considered technology investment essential for scaling co-creation. Interviewees noted that digital tools reduce ambiguity because customers can comment directly on artwork, layouts, colours and label elements rather than relying only on email descriptions or verbal feedback. Sustainability also emerged as a strong driver of customer co-creation. Customers increasingly seek packaging that uses responsible materials, reduces waste and communicates environmental commitment. Figure 4 presents the main design considerations that emerged from interview coding. Eco-friendly materials, functional convenience and cost feasibility were the most prominent themes. The figure also indicates that aesthetics, brand communication and regulatory fit remain important supporting themes. These results show that sustainable packaging co-creation must balance environmental aspirations with commercial and operational realities.

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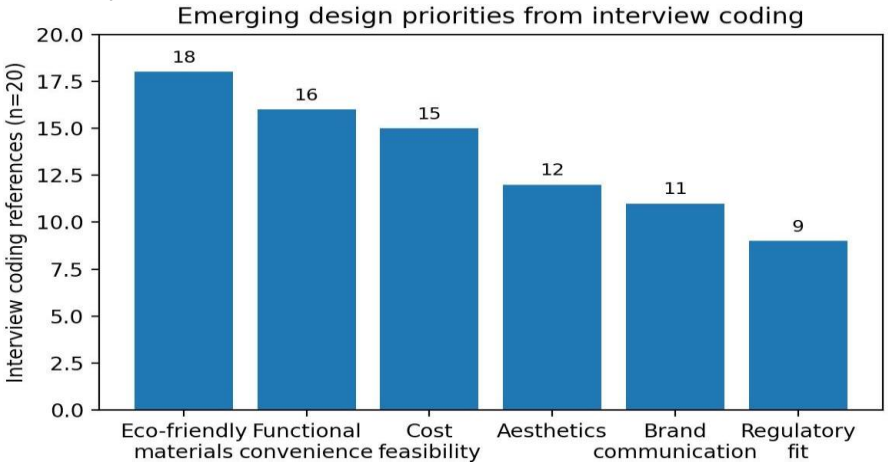


Figure 4. Thematic priority coding of emerging customer design considerations

6. Discussion

6.1 Critical Success Factors

The findings identify four critical success factors for customer co-creation in the printing and packaging industry: clear communication, early customer involvement, digital technology and organisational support. These factors are consistent with the DART framework proposed by Prahalad and Ramaswamy (2004), where dialogue, access, risk assessment and transparency support meaningful collaboration. In this study, dialogue appeared through regular design discussions and feedback cycles, access appeared through digital and interpersonal channels, risk assessment appeared through balancing cost, timing and feasibility, and transparency appeared through clear communication of production constraints.

Early customer involvement was particularly important because it allowed firms to identify design priorities before major production decisions were made. This reduced the risk of late-stage redesign and improved the relevance of the final packaging solution. Digital technology strengthened this process by making feedback faster, more visual and easier to document. However, technology alone was not sufficient. Organisational commitment was needed to ensure that customer input was not collected symbolically but was actually used in design and production decisions.

6.2 Interpretation of the Regression and Mediation Results

The regression results show that customer co-creation capability remains a significant predictor of value capture even after controlling for firm size, region and stakeholder category. This supports the argument that co-creation is not merely a by-product of being a larger or more resource-rich firm. Instead, the way firms organise customer involvement appears to influence their ability to capture value from packaging innovation. Digital collaboration also had a significant effect, which confirms that the quality of customer interaction is increasingly shaped by the tools through which design feedback is exchanged, documented and approved.

The mediation result adds further explanation by showing that operational efficiency partially mediates the co-creation–value capture relationship. This means that co-creation generates value not only because customers feel included, but also because early and structured involvement can reduce avoidable redesign, clarify specifications and improve approval accuracy. This finding is important for packaging firms because one of the common criticisms of co-creation is that it increases time and cost. The results suggest that co-creation can improve efficiency when it is organised through clear procedures and digital systems. Poorly managed co-creation may create delays, but disciplined co-creation can reduce uncertainty and improve commercial outcomes.

6.3 Theoretical Contribution

The study contributes to value co-creation theory by showing that customer participation must be connected to value capture mechanisms in operationally constrained sectors. Much of the co-creation literature explains interaction, engagement and perceived value, but the present study shows that the managerial challenge is to translate customer knowledge into design routines, production decisions and economic outcomes. In the printing and packaging industry, value is co-created through dialogue and feedback, but it is captured through repeat orders, reduced rework, faster approvals, stronger differentiation and sustainability alignment.

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The study also extends the resource-based view by explaining how customer knowledge can become a valuable organisational capability. Customer insight itself is not automatically a strategic resource. It becomes valuable when firms develop routines for collecting, interpreting, storing and applying it. It becomes rare and difficult to imitate when it is embedded in long-term customer relationships, digital proofing systems, cross-functional design routines and accumulated project learning. This contribution is important because it links external customer knowledge with internal organisational capability, thereby bridging value co-creation theory and strategic management theory.

6.4 Practical and Managerial Implications

For managers, the study shows that customer co-creation should be treated as a disciplined capability rather than an informal consultation activity. Managers should not assume that more customer involvement automatically produces better results. Effective co-creation requires clear boundaries, timelines, decision authority, technical feasibility checks and documentation of design changes. Firms should involve customers before key material and structural choices are locked in, but they should also communicate cost, production and regulatory constraints early in the process.

The findings also show that digital collaboration tools can improve both customer experience and operational efficiency. Online proofing systems, shared design boards, approval logs and virtual prototype reviews can make customer feedback more precise and easier to trace. Such tools are especially valuable in packaging projects where multiple stakeholders may comment on artwork, claims, colours, dimensions and sustainability features. Managers should also train employees to interpret customer feedback constructively rather than treating it as a disruption to technical routines.

Sustainability-led co-creation is another important implication. Customers increasingly expect packaging to reflect environmental responsibility, but sustainable packaging decisions often involve trade-offs between material performance, cost, regulation and consumer perception. Co-creation can help firms identify which sustainability features customers truly value and which compromises are acceptable. This makes sustainability more than a compliance issue; it becomes a source of customer value, brand trust and competitive differentiation.

7. Recommendations

First, firms should invest in digital collaboration tools that allow customers, designers and production teams to review prototypes, share feedback and approve revisions in real time. These tools can reduce delays and create a clear record of design decisions. Second, firms should involve customers at the initial design stage before major material and production choices are locked in. Early involvement improves the quality of customer input and reduces the cost of revision.

Third, firms should develop formal co-creation protocols. These protocols should define when customers are involved, what type of feedback is required, who approves revisions, how technical feasibility is assessed and how sustainability trade-offs are documented. Fourth, firms should treat customer feedback as a strategic knowledge resource. This requires training employees in customer communication, feedback interpretation and collaborative problem-solving. Fifth, firms should integrate sustainability into co-creation by asking customers to participate in decisions related to materials, recyclability, waste reduction, environmental claims and end-user communication.

Finally, industry associations and policymakers can support co-creation by encouraging knowledge-sharing platforms, sustainability standards and incentives for collaborative innovation. Small and medium-sized firms may need particular support because they often lack the digital infrastructure required for advanced collaboration. Shared training programmes, sector-level digital tools and sustainability guidance could help such firms improve co-creation maturity without facing excessive cost burdens.

8. Limitations and Future Research

The study has some limitations. The purposive sampling method was appropriate for selecting knowledgeable participants, but it limits the generalisability of the findings. The study was also cross-sectional, which means it captured perceptions at a single point in time rather than tracking long-term performance effects. In addition, the survey relied on self-reported perceptions, which may be influenced by recall bias or social desirability bias. Although triangulation improved the credibility of the findings, future research could use longitudinal data, firm-level performance indicators and larger probability-based samples.

Future research may examine how artificial intelligence, blockchain, augmented reality and advanced design analytics influence customer co-creation in packaging. Further

studies could compare co-creation practices across packaging sub-sectors such as food packaging, pharmaceutical packaging, luxury packaging, corrugated packaging and industrial packaging. Another useful direction would be to investigate how sustainability-led co-creation affects customer trust, brand equity, willingness to pay and long-term buyer-supplier relationships. Future research could also examine whether digital collaboration has different effects for small, medium and large firms.

9. Conclusion

This paper examined customer co-creation as a strategic approach to value capture in the printing and packaging industry. The findings show that co-creation can improve design quality, customer satisfaction, loyalty, market differentiation and responsiveness when it is supported by early involvement, clear communication, digital collaboration and organisational commitment. The study also shows that co-creation is not free from challenges. Expectation misalignment, time pressure, cost implications and weak technology integration can reduce its effectiveness.

The paper contributes to theory by linking customer co-creation with the resource-based view and showing how customer insight can become a strategic resource in packaging innovation. It extends value co-creation theory by demonstrating that customer participation must be connected to value capture mechanisms such as operational efficiency, differentiation, loyalty and sustainability alignment. It contributes to practice by identifying specific process conditions that help firms convert customer participation into value capture. For managers, the central implication is clear: customer co-creation should be managed as a structured capability, not as an occasional feedback exercise. When firms organise customer knowledge carefully, co-creation can support innovation, sustainability alignment and competitive advantage in a demanding industry.

References

1. Barney, J. B. (1991). Firm resources and sustained competitive advantage. Journal of Management, 17(1), 99-120. https://doi.org/10.1177/014920639101700108
2. Calabrese, A., Forte, G., & Mauriello, F. (2020). A framework for sustainable value co-creation through customer engagement. Sustainability, 12(8), 3245. https://doi.org/10.3390/su12083245
3. Herrmann, C., Rhein, S., & Sträter, K. F. (2022). Consumers' sustainability-related perception of and willingness-to-pay for food packaging alternatives. Resources, Conservation and Recycling, 181, 106219. https://doi.org/10.1016/j.resconrec.2022.106219
4. Latinovic, Z., & Chatterjee, S. C. (2024). Value co-creation: Balancing B2B platform value and potential reverse-value effects. Journal of Business Research, 175, 114518. https://doi.org/10.1016/j.jbusres.2024.114518
5. López-Mas, L., Claret, A., Bermúdez, A., Llauger, M., & Guerrero, L. (2022). Co-creation with consumers for packaging design validated through implicit and explicit methods: Exploratory effect of visual and textual attributes. Foods, 11(9), 1183. https://doi.org/10.3390/foods11091183
6. Mattia, G., Di Leo, A., & Pratesi, C. A. (2021). Recognizing the key drivers and industry implications of sustainable packaging design: A mixed-method approach. Sustainability, 13(9), 5299. https://doi.org/10.3390/su13095299.
7. Morashti, J. A., An, Y., & Jang, H. (2022). A systematic literature review of sustainable packaging in supply chain management. Sustainability, 14(9), 4921. https://doi.org/10.3390/su14094921
8. Otto, S., Strenger, M., Maier-Nöth, A., & Schmid, M. (2021). Food packaging and sustainability: Consumer perception vs. correlated scientific facts: A review. Journal of Cleaner Production, 298, 126733. https://doi.org/10.1016/j.jclepro.2021.126733
9. Payne, A. F., Storbacka, K., & Frow, P. (2008). Managing the co-creation of value. Journal of the Academy of Marketing Science, 36(1), 83-96. https://doi.org/10.1007/s11747-007-0070-0
10. Prahalad, C. K., & Ramaswamy, V. (2004). Co-creating unique value with customers. Strategy & Leadership, 32(3), 4-9. https://doi.org/10.1108/10878570410699249
11. Ramaswamy, V., & Ozcan, K. (2018). The co-creation paradigm. Stanford University Press. https://doi.org/10.1515/9780804792622
12. Royo-Vela, M., Leszczyński, G., & Velasquez-Serrano, M. (2022). Sustainable value co-production and co-creation in virtual reality: An exploratory research on business-to-business interactions. Sustainability, 14(13), 7754. https://doi.org/10.3390/su14137754
13. Schreieck, M., Wiesche, M., & Krcmar, H. (2021). Capabilities for value co-creation and value capture in emergent platform ecosystems: A longitudinal case study of SAP's cloud platform. Journal of Information Technology, 36(4), 365-390. https://doi.org/10.1177/02683962211023780

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ISSN: 2208-2190 Pages- 23-36
DOI: https://doi.org/10.69980/3bj0x919

14. Shulga, L. V., Busser, J. A., Bai, B., & Kim, H. (2021). The reciprocal role of trust in customer value co-creation. Cornell Hospitality Quarterly, 62(1), 108-122. https://doi.org/10.1177/1096348020967068
15. Tran, T. B. H., & Vu, A. D. (2021). From customer value co-creation behaviour to customer perceived value.Journal of Marketing Management, 37(9-10), 993-1026. https://doi.org/10.1080/0267257X.2021.1908398
16. Vargo, S. L., & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. Journal of Marketing, 68(1), 1-17. https://doi.org/10.1509/jmkg.68.1.1.24036