

Balancing Between Efficiency Value and Service Value in Delivering Customized Solutions



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Abstract Companies that deliver customized solutions through projects are interested both in the efficient resource use in their manufacturing process and complementing a core product with services to fulfill customers' specific needs, that is, efficiency value and service value. Firms face tensions, trade-offs, and synergies in aligning efficiency value and service value. This study focuses on the development and delivery of customized solutions in business-to-business (B2B) settings, aiming to uncover project actors' perceptions of efficiency value and service value and the mechanisms used to balance them. A qualitative exploratory study conducted in two software companies and two shipyards reveals that service value and efficiency value are perceived through three aspects: benefits and sacrifices (from both short-term and long-term perspectives), related lifecycle phases and activities, and various enablers. Ten balancing mechanisms harmonize the tensions and trade-offs between these two values. Internal balancing mechanisms include standardizing, modularizing, configuring, reusing, and scaling. External balancing mechanisms comprise co-creating, negotiating, adapting, bargaining, and segmenting. These findings enhance our understanding of value perceptions from a dual-lens perspective and illuminate balancing mechanisms in project business and solution delivery. The examination of software firms and shipyards broadens mass customization research by providing empirical evidence from unconventional contexts.

Keywords Customized solutions · Projects · Service value · Efficiency value · Value balancing

1 Introduction

Businesses are increasingly concerned with what kind of value they can offer to their customers, while also bringing commercial value to themselves. Value in business-to-business (B2B) settings refers to a compromise of benefits and sacrifices [1], and

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339

it is often considered from the perspective of customers and other stakeholders [2]. Value is multi-dimensional—it can cover economic, ecological, social, and aesthetic dimensions—and can be viewed from multiple perspectives [3]. In project business, identifying the most critical values and delivering them through implementing a project contribute to both project success and overall business performance [4]. This study deals with B2B firms' pursuit of multiple aspects of value simultaneously.

Customized solutions such as turnkey machinery complemented with installation and training; or IT systems supported with consulting are integrated offerings combining products and services to resolve complex customer needs [5]. Delivering customized solutions involves making tradeoffs, for example, between accommodating specific customers' needs and maximizing productivity [5].

Service value and efficiency value are central to this tradeoff. Service value implies an emphasis on maintaining the customer relationship [6, 7]. Solution providers deliver this value by responding to customer needs, enhancing customer loyalty, extending lifecycles for new business, and ultimately creating differentiation that contributes to project success [6, 7]. Efficiency value emphasizes maximizing productivity. Solution providers deliver this value by utilizing digitalization, streamlining processes, enhancing collaboration and communication among stakeholders, and thereby converting inputs into outputs more effectively [8, 9].

Previous research has clarified what constitutes value and how to create it [1–4], and what are the tensions and trade-offs of value-related elements [10–12] in project business and related domains. Further research is needed to explore the perception of two critical values and the mechanisms that support their balance and synergy in project delivery. The purpose of this study is to deepen the understanding of tensions, trade-offs, and synergies between efficiency and service value in customized solutions. The goal is to reveal the mechanisms of balancing these values in different project settings. Two research questions will guide the study:

- How do project actors perceive service value and efficiency value in projects that deliver customized solutions?
- How (through what kinds of mechanisms) do project actors balance service value and efficiency value in these projects?

This study focuses on business-to-business (B2B) solution delivery projects, particularly those in industries with customization complexity, such as software development and shipbuilding. Project actors here refer to the key stakeholders involved in delivering customized solutions. The research excludes projects that solely concentrate on services, mass-market solutions, and external factors such as cultural differences.

2 Theoretical Background

Prior research has extensively examined the paradoxes and tensions that exist within project business and related domains such as customization, services, and innovation management. Studies have analyzed the interplay between customization and standardization in maintaining customer loyalty [10], the exploration–exploitation trade-offs in driving innovation [11], and the tension of flexibility and stability in achieving organizational harmony [12]. These dual pursuits are closely related to values, and there is a need for further knowledge on value-related performances in different contexts, as selecting and implementing the right values is critical to project success and overall business performance [2].

Firms need to apply some balancing mechanisms to create harmony and synergy in delivering customized solutions. Previous research offers a solid foundation on what constitutes value and how to create it [1–4] and clarifies specific values such as “added value” [13] and “strategic value” [14]. However, there remains a notable gap in balancing two critical values, efficiency and service value. The search of balance will require examining enablers [15] at the macro level and exploring lifecycle stage relationships [16] at the micro level. Moreover, adopting a “both-and” perspective rather than an “either-or” compromise [17] further helps achieve synergy between these dual values.

This research adopts customized solution projects as the investigation context, selects service value and efficiency value as critical values, and analyzes the tensions between these two values and the mechanisms for balancing them.

3 Research Method

We implemented a qualitative exploratory interview-based study, to search responses to the how-type questions [18]. We selected four firms operating in the ship-building and software industries as representatives of different contexts for delivering customized solutions. Shipyards deliver highly customized vessels where each project is unique and operations are precisely planned and controlled, offering an ideal context to explore how service value and efficiency value are harmonized in settings that demand precision and tailored solutions. In contrast, software companies adapt standardized modules to meet customer needs through flexible processes, providing a complementary perspective on balancing these values in rapidly evolving, scalable environments. All target firms operate internationally, their main operations are in a European country (different for each firm), they are medium to large, and they are considered successful in their business. They all offer unique and/or customized solutions to their customers, but the extent of customization differs.

Data were gathered primarily through individual, in-depth interviews [18] with employees representing various phases in the solution design and delivery process, such as customer interface, customer needs translation and solution design, and

implementation and execution. In total, we conducted 12 interviews with such key informants that have first-hand knowledge of customized solution design and delivery. The interviewees included top managers (business development manager, managing director, head of product lifecycle management), middle managers (product managers, sales managers), and experts (chief data officer, consultant). Additionally, some secondary data were gathered from the firms' internal documents and public sources, to offer background information and verify some interview findings.

A semi-structured interview outline was developed for the interviews. The questions covered the nature of the customized solutions, the process of solution delivery, perceptions of service value and efficiency value, and internal and external balancing mechanisms of these values. We encouraged informants to answer questions based on their previous project delivery experiences. The interviews lasted 45–60 min, they were held either face to face or online, and they were audio-recorded and transcribed.

To analyze the data, we compared and interpreted the interview transcripts, researcher's notes, and relevant secondary data. Guided by our pre-understanding of theory and an initial open-ended reading of the transcripts, the analysis proceeded in the following steps. First, each insight was assigned a code [19, 20] if it appeared in at least one primary source; data to service value and efficiency value were coded separately from those referring to internal and external balancing mechanisms. Second, we identified 3 key aspects in the perception of service and efficiency values—benefits and sacrifices (short-term and long-term), related lifecycle phases, and enablers—and developed 10 themes (Fig. 1) related to the balancing mechanisms. Third, we categorized these ten themes into internal and external balancing mechanisms and synthesized the findings to construct a comprehensive understanding of how project actors perceive and balance service and efficiency values. Additionally, we conducted a comparative analysis across industries (shipbuilding versus software) and roles (managing, customer-facing, and operational/engineering) to reveal nuanced differences in these perceptions and balancing strategies. Our theoretical pre-understanding initially guided the coding process, and we revisited the theory, data, and coding structures iteratively until stable, coherent findings emerged [19, 20].

4 Findings

4.1 *Project Actors' Perception of Service Value and Efficiency Value*

The empirical evidence (in Fig. 2) illustrates how project actors perceive service value and efficiency value. Their perception of these two values mainly focuses on three aspects.

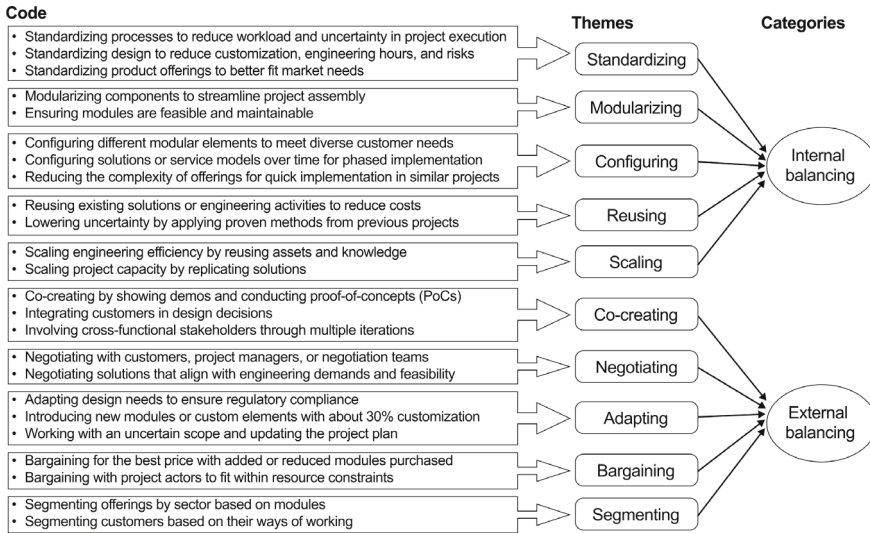


Fig. 1 Coding for internal and external values balancing mechanisms

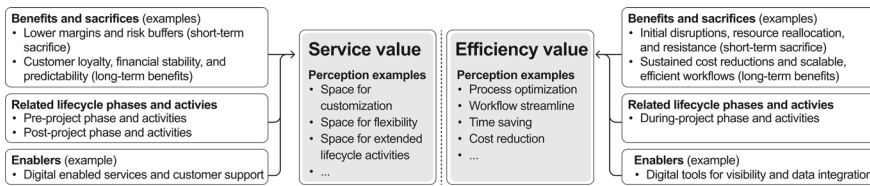


Fig. 2 Project actors' perception of service value and efficiency value

Benefits and sacrifices (short-term and long-term). Both values refer to a compromise of benefits and sacrifices and could be considered and achieved through a single project (short-term) or a sequence of multiple projects (long-term). Project actors in different project contexts understand these differently. In shipbuilding, managing and customer-facing actors perceive short-term sacrifices—such as accepting lower margins and investing in risk buffers—as necessary investments that secure long-term customer loyalty, financial stability, and predictability in highly customized projects. According to an interviewee: *“Create a long-term relationship with customers is a long win. If the customer is not happy, then next time they will seek a different owner [SB2P2].”* While operational and engineering teams focus on achieving immediate efficiency gains by streamlining production processes and optimizing labor allocation, which helps reduce the complexity and high costs inherent in customized projects. As an interviewee stated, *“Each ship requires around 700,000 to 1,000,000 man-hours, so even a 10% efficiency gain leaves a large portion of costs tied to labor [SB2P2].”* Conversely, in the software industry, project actors view the short-term costs of accommodating customer needs (for instance, adapting standardized

modules) as strategic investments that foster scalability, and streamlined processes over the long term.

Related lifecycle phases and activities. The realization of dual values is closely tied to specific lifecycle phases in project delivery. Interviewees in both industries indicate that pre-project and post-project activities primarily contribute to service value, while during-project activities are mainly associated with efficiency value. For example, in shipbuilding, design activities with improved visualization in the pre-project phase and proactive maintenance in the post-project phase drive service value, and digitalized engineering and production during the project phase enhance efficiency value. Similarly, in the software context, successful system integration in the pre-project phase and the development of data insights, dashboards, and reports in the post-project phase play a key role in realizing service value. According to an interview, *“PLM and IoT data integration can monitor machine working hours, material usage, and track equipment delivery, thus support broader operation with insights [SWIP2].”*

Enablers. Service and efficiency values are enabled by digitalization. In terms of service value, digital tools such as cloud platforms and document management systems facilitate rapid software updates, prompt notifications, and efficient revisions, thereby strengthening customer support. As one interviewee explained, *“We use PLM platform to do manage documents, notify revisions, and communicate with multi stakeholders in shipbuilding projects [SWIP1].”* For efficiency value, digitalization, like digital twins and PLM platforms, drives process optimization and cost reductions. According to an informant: *“We aim to build a ‘single source of truth,’ meaning one central place for all data to avoid confusion [SBIP2].”*

These three aspects shape project actors’ overall understanding of service and efficiency values. For service value, project actors’ perception examples include the space for customization, flexibility, and extended after-project activities. For efficiency value, perception examples encompass process optimization, streamlined workflows, time savings, and cost reductions. Moreover, these companies pursue both values simultaneously throughout the project process, necessitating a balance between them.

4.2 Mechanisms to Balance Service Value and Efficiency Value

The empirical evidence (in Fig. 1) shows the internal and external mechanisms that project actors use to balance service value and efficiency value and create harmony potentially driving project success.

Internal Balancing. Mechanisms such as standardizing, modularizing, configuring, reusing, and scaling help harmonize the dual demands of satisfying customer needs and maintaining efficient operations. For example, a modular design enables different

product combinations to be formed quickly, supporting both operational efficiency and customized outcomes: “*We have a technology platform, and it consists different modular elements. They are like Lego bricks, and you can just combine them into combination based on customer needs [SW2P1].*” Design reuse increased service-ability but also efficiency: “*To improve efficiency, the shipyard reuses designs, such as propulsion systems, allowing earlier documentation submission to suppliers, which can speed up production [SB1P1].*” These actions work by aligning different internal actors—those focused on sales, product development, implementation, and delivery—to work with flexibility and efficiency. For instance, standardizing and configuring processes ensure that even customized projects follow common templates, while modularizing and reusing designs enable faster turnaround and reduce re-engineering efforts.

External Balancing. Actions such as co-creating, negotiating, adapting, bargaining, and segmenting facilitate alignment between the customer side and the solution provider side. These external mechanisms are crucial for ensuring that client expectations are met while also maximizing productivity. Through co-creation and negotiation, project actors engage with customers to tailor solutions that reflect their unique needs. As one informant explained: “*We try to provide a good service with our customers, and they are happy, and they come back, and we try to be flexible [SB2P2].*” At the same time, adapting and bargaining help accommodate differing priorities between external stakeholders, ensuring that service enhancements do not compromise efficiency.

5 Conclusions

These findings advance our understanding of value creation in project business, customization, and innovation research in three ways. Firstly, service value and efficiency value, as two more specific values, are identified and clarified, thereby adding to prior value emphasis like “added value” [13] and “strategic value” [14]. Secondly, the study introduces a dual-value lens for understanding the trade-offs between two values by incorporating insights from dual pursuits [10–12], which fills the gap regarding these critical values in value creation. Thirdly, by responding to the need for a more nuanced understanding of values [15, 16] from a dual-value perspective, the study adds both macro-level aspects, such as enablers, and micro-level aspects, such as related lifecycle phases and activities, to the overall understanding of values. By integrating these findings with previous knowledge [1–4], value can be understood more holistically in terms of what constitutes value, how to create it, and how to perceive it through a dual-value lens.

The resulting thematic framework offers a new comprehensive approach to creating harmony and synergy between values [17] and resolving tensions and trade-offs that are critical for project success [10–12]. Furthermore, evidence from

software firms and shipyards contributes to mass customization research in unconventional contexts [21]. Unlike traditional mass customization industries, software firms provide digital applications while shipyards deliver highly tailored vessels, representing extreme cases of service-driven and engineering-intensive customization.

The findings have implications for practitioners in B2B solution delivery. Identification of values and related trade-offs helps practitioners communicate and negotiate priorities. The balancing mechanisms help them structure actions to create synergy and harmony, to consequently achieve project success.

The focus on software firms and shipyards, the selection of informants, and the number of informants and firms constrain the broader applicability of the findings. The use of qualitative analysis limits generalizability. In the future, researchers could employ quantitative methods, such as surveys, to test the findings and explore individual-level views and other industry contexts. Additionally, this study adopts a relatively static perspective, failing to consider potential shifts and changes within the project lifecycle. Therefore, we recommend that future research examine how tensions and balancing methods evolve throughout different project phases and assess the impact of project shifts on these mechanisms. Lastly, researchers could explore the implications of project-level value balancing at the firm, supply chain, and network levels.

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