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Management as a design practice: a multi-case study on designing value co-creation mechanisms

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Abstract

Management and organisation researchers argue that the development of management as a design science could address the long-standing debate regarding the relevance of management research to practice. Advocates of this view emphasise the necessity of prescription-driven research within the field. Drawing inspiration from design and design thinking research, this paper argues that most management and organisation design challenges are wicked problems, necessitating the involvement of multiple stakeholders in the problem-solving process, while recognising the limitations of prescriptive knowledge. To solve these problems, it is essential for managers to adopt the role of pragmatic designers or problem-solvers. Consequently, this paper proposes that management should be examined as a design practice to bridge the gap between research and practice. Through a multi-case study of the managerial task of designing value co-creation mechanisms, this paper explores three dimensions of managers' design activities: managers as designers, managing as designing and organisation design. The objectives are to explore the roles of managers in designing value co-creation mechanisms and to develop a framework that supports relevant design practices. The findings highlight the importance of studying management as a design practice, thereby extending current discussions on the development of management as a design science and the application of design thinking within management practice.

Keywords: Management as a design science, Management as a design practice, Pragmatism, Design thinking, Value co-creation

Introduction

The concept of management as a design science was first introduced by Herbert Simon ([1969](#)) in his seminal book, *The Sciences of the Artificial*. He argued that the goal of the designer's problem-solving process is to employ searching strategies to identify satisfactory alternatives for decision-making amid the complexities of the real world, where optimisation is often unattainable. Recognising the critical role of problem-solving in management practices, Simon advocated for the establishment and teaching of a design science within management schools. Over the past two decades, Simon's emphasis on the routines of engineers in designing technical artefacts has inspired management

researchers to address the ongoing debate regarding the relevance of management research to practice (Hatchuel, 2001; Opdenakker & Cuypers, 2019; Pandza & Thorpe, 2010). Scholars such as Romme (2003), Van Aken (2005), Denyer et al. (2008), Holmström et al. (2009) and Tanskanen et al. (2017) have proposed a prescription-driven approach to bridging the gap between science and design by redefining management research hypotheses as design propositions or technological rules.

However, the notion of constructing a prescriptive theory of management comes with inherent limitations, particularly since many problems cannot be resolved through rational, objective and systematic processes. Rittel and Webber (1973) decribed these problems as "wicked problems" and identified ten characteristics, such as "solutions … are not true-or-false, but good-or-bad", "no immediate and no ultimate test of a solution", "every wicked problem is essentially unique" and "every wicked problem can be considered to be a symptom of another problem" (pp. 162–165). Recently, academic literature has highlighted that the concept of wicked problems aligns closely with contemporary problem-solving priorities, making it likely to gain acceptance among a diverse and interdisciplinary research community (Crowley & Head, 2017; Lönngren & Van Poeck, 2021). In management practice, many managerial and organisational challenges are indeed wicked problems, which means that prescriptive knowledge may often fall short. Some management researchers, including Hatchuel (2001), Boland et al. (2008) and Schmitt (2019), advocate for embracing the pragmatic philosophical stance of professional designers. They argue that managers should learn from design practitioners and adopt pragmatic approaches to address wicked management and organisational design challenges (Dalsgaard, 2014; Mailhot & Lachapelle, 2022).

Researchers must recognise managers as designers who possess extensive practical experience in addressing management and organisation design challenges. While relevant research can draw inspiration from the design practices of professional designers, it is essential to build knowledge from the practical design experiences of managers. This approach not only aids researchers in understanding managerial design practices, but also contributes to the development of new theories, research paradigms and design tools. Furthermore, it enables researchers to evaluate the relevance and applicability of professional designers' problem-solving methodologies, such as design thinking, for managerial contexts (Carlgren et al., 2013; Kolko, 2015; Nakata & Hwang, 2020; Rösch et al., 2023). To comprehend how managers, as design practitioners, navigate management and organisation design problems and create organisation artefacts such as strategies, business processes and structures, researchers must acknowledge and appreciate the pragmatic philosophical stance that managers typically adopt. In fact, most, if not all, managers likely operate as pragmatists in their professional settings.

This paper examines the design practices of managers through the lens of management as a design practice, specifically focusing on the task of creating mechanisms for value co-creation. This task is framed within a service-dominant logic, wherein the company operates as a service system that facilitates consumer-centred value co-creation through resource integration (Vargo & Lusch, 2004, 2008). Value co-creation regards knowledge and skills as essential resources and emphasises the importance of establishing service networks and relationships to enhance the effectiveness of resource acquisition, development and integration. Research on value co-creation, guided by service-dominant

logic, investigates the interactions among participants, processes and resources in the co-creation of value (Vargo & Lusch, 2004). Economic actors engaged in value co-creation within service networks are conceptualised as resource integrators who integrate resources for their own benefit (Pera et al., 2016; Vargo & Lusch, 2004).

According to service-dominant logic, the primary responsibility of companies and managers is to design and implement value co-creation mechanisms, as well as to establish and maintain value co-creation networks and relationships to ensure the effectiveness of these mechanisms (Ajmal et al., 2024; Nam et al., 2009). While the design of value co-creation mechanisms is not a new research area, there is a lack of studies examining this task through the lens of managers' design practices. A qualitative study involving 86 interviews with managers from various industries revealed that value co-creation is a complex process characterised by heterogeneous actors and resources, rapidly changing contextual conditions and frequent conflicts and misalignments among the interacting parties (Corsaro, 2019). Given its subjectivity, context-dominant, social, interactive and dynamic nature, value co-creation presents unique challenges for effective management (Saha et al., 2022).

The complexity of this managerial design task necessitates its examination as a design practice, specifically by deriving knowledge from managers' design experiences to address the relevance gap between theory and practice. The research question guiding this paper is: How can managers design value co-creation mechanisms? The objectives are to explore the roles of managers in designing value co-creation mechanisms and to develop a framework that supports relevant design practices.

The structure of the paper is as follows. First, a literature review introduces three dimensions of management as a design practice: managers as designers, managing as designing and organisation design. Based on these dimensions, seven propositions are presented regarding how managers can design mechanisms for value co-creation. Next, the paper outlines the research methodology employed, followed by a multi-case study involving three small companies. This multi-case study generates extensive empirical data to validate the propositions. The confirmed propositions can function as a guiding framework to support managers in the design of value co-creation mechanisms.

Literature review

Management as a design practice: three dimensions of design activities

Classical management science theory identifies five fundamental elements of management: forecasting/planning, organising, commanding, coordinating and controlling (Hales, 1999). In management studies, researchers often focus on specific managerial tasks, roles, jobs or functions as entry points to gain insights into the filed (Hales, 1999). In fact, managers—especially founders and subsequent change agents—also play a crucial role in the construction, design and development of organisation (Simon, 1996; Van Aken, 2005). Dorst (2004) posited that any methodology supporting design activities must encompass statements or assumptions regarding the three "dimensions of design activities": the designer, the dynamics of the design process and the design problem or task. This study aims to explore the design practices of managers in relation to value co-creation mechanisms through these three dimensions: managers as designers (corresponding to the designer dimension), managing as designing (associated with the design

process dimension) and organisation design (related to the design problem or task dimension) (see Fig. 1). These dimensions are evident in the literature on design thinking and management as a design science (Buchanan, 1992; Frisk & Bannister, 2017; Pandza & Thorpe, 2010; Salgado et al., 2022; Van Aken, 2005). This section reviews the pertinent literature and subsequently proposes propositions for designing value co-creation mechanisms.

Managers as designers

Managers as the main designers of value co-creation mechanisms

Simon (1996) highlighted the critical need for organisation design to be addressed within business school curricula. In the past two decades, numerous management and organisation researchers have investigated this subject (Jelinek et al., 2008; Mohrman, 2007; Mohrman et al., 2001; Romme, 2003; Van Aken, 2005; Van Aken & Romme, 2009). One notable example is Van Aken's (2005) examination of organisation design through an evolutionary lens, viewing organisations as artefacts that are constructed, designed and developed by their founders and subsequent change agents. Furthermore, in the design thinking literature, Buchanan (1992) emphasised over 30 years ago that both designers and managers have a responsibility to design activities and organised services, particularly concerning the integration of resources, which remains a significant focus for traditional managers.

Within the framework of service-dominant logic, managers—whether founders or subsequent change agents—can serve as the primary designers of value co-creation mechanisms (Kim & Choi, 2019; Lambert & Enz, 2012). Designing these mechanisms necessitates a multi-stakeholder perspective. In this context, a company's value co-creation network comprises employees, suppliers, business partners, allies and customers (Saarijärvi et al., 2013). Companies formulate competitive value propositions based on their core strengths, especially operant resources, and realise these value propositions by integrating various resources and processes. A fundamental question is "what kind of value is co-created for whom, using what resources, and through what mechanism?"
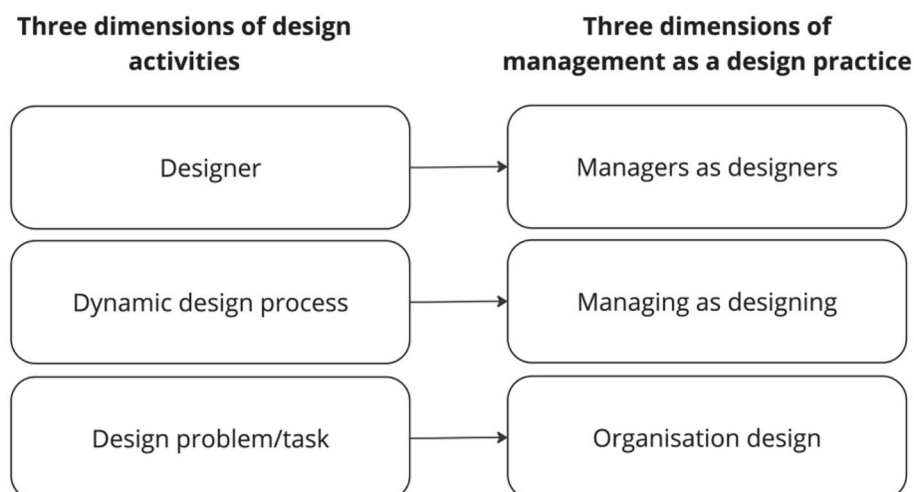

Fig. 1 Three dimensions of management as a design practice

(Saarijärvi et al., 2013). The existing literature has identified several value co-creation mechanisms, including co-distribution, co-development, or co-outsourcing (Re & Magnani, 2022; Saarijärvi, 2012).

Acknowledging the complexities and managerial challenges inherent in value co-creation, several tools have been developed for managers. For example, Payne et al. (2008) proposed a process-based conceptual framework to enhance the understanding and management of value co-creation. Additionally, Frow et al. (2015) created a cross-functional, cross-company collaboration framework aimed at identifying and implementing value co-creation initiatives. This framework encompasses six dimensions: co-creation motives, forms of co-creation, participants, engagement platforms, level of engagement and duration of engagement. However, these tools were not grounded in managers' practical experiences with designing value co-creation mechanisms, indicating a need for further examination of their relevance and practical utility. It is crucial to understand how managers in real-world settings develop solutions and make decisions regarding value co-creation mechanisms.

Building on the above, this paper proposes the following proposition:

Proposition 1: *Managers can be the primary designers of value co-creation mechanisms.*

Managers' decision-making process for ensuring the effective operation of value co-creation mechanisms: problem-solving and decision-making

Traditional theories in management science conceptualise the decision-making process as a distinct management function, where problem-solving plays a crucial role (Drucker, 1955). Regardless of their specific responsibilities, managers fulfil their role by establishing goals and making decisions to achieve those goals, often involving problem-solving activities (Comfort & Wukich, 2013; Drucker, 1955; Simon, 1996). Simon et al. (1987) differentiated between problem-solving and decision-making activities within this process, characterising the problem-solving process as design:

> *It is work of choosing issues that require attention, setting goals, finding or designing suitable courses of action, and evaluating and choosing among alternative actions. The first three of these activities—fixing agendas, setting goals and designing actions—are usually called problem solving; the last, evaluating and choosing, is usually called decision-making (Simon et al., 1987, p.11).*

In his book *The Sciences of the Artificial*, Simon (1996) indicated that the goal of a designer's problem-solving process is to identify satisfactory alternatives for decision-making when confronted with the complexities of the real world.

These traditional theories continue to be evident in contemporary management literature (Abubakar et al., 2019; Asemi et al., 2011; Comfort & Wukich, 2013; Decreton et al., 2023; Karhu & Ritala, 2018; Mikušková, 2017; Nickerson et al., 2012). For example, several management and design researchers (Boland & Collopy, 2004; Boland et al., 2008; Frisk & Bannister, 2017), drawing inspiration from Simon's work and the problem-solving approaches of architects, argued that management education and practice should cultivate both a

"decision attitude" and a "design attitude", which are essential for driving innovation and improvement in organisations. In this paper, the design of value co-creation mechanisms is seen as a complex design problem or task, with decision-making presenting merely the final step in the problem-solving process.

Building on the above, this paper proposes the following proposition:

Proposition 2:   *Managers need to develop solutions and make decisions for the problems of value co-creation mechanisms.*

Managers facilitate value co-creation through value co-creation mechanisms

According to Simon (1996), while addressing practical design problems in computer programming, designers can adopt the roles of controllers or manipulators. However, this notion does not extend to social design, including organisation design. He observed that in social or organisation design processes, conflicts of interest or uncertainties in professional judgement frequently emerge, leading to dynamic negotiations between designers and the stakeholders they serve. In these instances, stakeholders also act as designers pursuing their own goals, and neither party can act solely as a controller or manipulator within the design process. Similar perspectives are echoed in design thinking research (Adams et al., 2011; Kimbell, 2011). For design to achieve its maximum effectiveness, designers often must take on the role of facilitator, actively engaging stakeholders throughout the design process (Darzentas & Darzentas, 2014; Kimbell, 2009; Mosely et al., 2021; Trischler et al., 2019).

In recent years, inspired by Simon, some management and organisation researchers have recognised the significance of viewing managers as facilitators (Pandza & Thorpe, 2010; Van Aken, 2005). For example, Visscher and Fisscher (2012) highlighted the necessity of involving employees in organisation design to facilitate collaboration, communication, negotiation and self-organisation, all of which can contribute to effective problem-solving. They also suggest that managers deliberately leave organisation design incomplete to create better interfaces with external stakeholders, including customers, ensuring that their needs are effectively translated into internal requirements. The adoption of the concept of value co-creation varies across industries (Frow et al., 2015). For example, the retail, hospitality and telecommunications industries employ distinctly different mechanisms for value re-creation (Saha et al., 2022). Therefore, managers must design value co-creation mechanisms that are specifically tailored to the characteristics of their specific industry and actively motivate stakeholders to engage in the value co-creation process.

Building on the above, this paper proposes the following proposition:

Proposition 3:   *Managers need to facilitate value co-creation through the design of value co-creation mechanisms.*

Managing as designing: design is a social process
Stakeholders in value co-creation

In addition to managers, Simon et al., (1987, 1996) highlighted that the work of various economic actors involves significant decision-making and problem-solving

activities. Simon (1996) posited that decentralising decision-making within an organisation can enhance the integration of information and skills. He observed that design can emerge even in absence of clearly defined designers, particularly in social systems that evolve in response to numerous human decisions. Building on Simon's insights, Romme (2003) argued that management and organisational issues should be understood within the social context of problem-solving and addressed through a solution-focused approach. He employed a case study to demonstrate how the involvement and participation of key stakeholders in decision-making and implementation during the design process can foster greater acceptance and commitment. Van Aken (2005) emphasised that organisations evolve through social interactions and learning processes among various internal and external stakeholders.

Simon (1996)'s characterisation of the design process for engineers and architects encourages management and organisation researchers to embrace the pragmatic viewpoints of professional designers and to adopt design thinking. This approach facilitates a deeper understanding of problem-solving, emphasising iterative solutions and multidisciplinary collaboration (Boland & Collopy, 2004; Dunne & Martin, 2006; Romme, 2003; Van Aken & Romme, 2012). These insights from management studies align with design thinking researchers' investigations into participatory design, distributed design, the co-evolution of problems and solutions and co-design (Warr & O'Neill, 2005; Smith & Iversen, 2018; Dorst, 2019a; Pedersen, 2020). For example, Jones (2018) noted that the concept of co-creation broadly encompasses participatory practices in design and decision-making in collaboration with stakeholders and users.

Value co-creation involves the interaction and integration of resources by all participants—such as companies, customers, suppliers, employees and other network partners—to achieve mutual benefits (Pinho et al., 2014; Vargo et al., 2008). Every stakeholder involved in the process, regardless of their role, engages in role-related decision-making (Hollebeek et al., 2022). Alford and Head (2017) identified three scenarios for addressing wicked problems involving multiple stakeholders, providing valuable insights into the problem-solving and decision-making behaviours of participants in value co-creation mechanisms, as well as into the design and evolution of these mechanisms.

- *Easiest situation scenario:* When there is minimal dispersion of knowledge or conflicting interests between managers and stakeholders, and neither party has a relative power advantage, managers are more likely to successfully acquire relevant knowledge and negotiate agreements with external stakeholders on appropriate actions to address the wicked problem.
- *Moderately difficult situation scenario:* In case where knowledge is dispersed among the parties but there is a general agreement among stakeholders about the nature of the problem and possible solutions, or are at least no strong opposition, managers may face increased difficulty in fostering collaboration to resolve the issue.
- *Most difficult scenario:* When both knowledge and interests are dispersed among stakeholders—where relevant knowledge concerning the problem is dispersed across multiple parties—managers will encounter significant challenges in collaborating with stakeholders to effectively address the problem.

Building on the above, this paper proposes the following propositions:

Proposition 4: *Stakeholders in value co-creation are also problem-solvers and/or decision-makers.*

Proposition 5: *The decision-making and problem-solving behaviours of stakeholders in the value co-creation process can be used to evaluate the effectiveness of the value co-creation mechanism and are key factors in its evolution.*

Managers must practise reflection-in-action to effectively solve problems in value co-creation mechanisms

In complex social design activities involving numerous stakeholders, managers must engage in reflection-in-action to identify viable alternatives and make informed decisions (Simon, 1996; Van Aken, 2004). Visscher and Fisscher (2012) highlighted the need for a new generation of organisation design approaches that integrate solution design with implementation. They suggested that design concepts such as reflection-in-action, co-creation (where design and implementation occur more or less simultaneously) and bricolage (where improvisation takes precedence over systematic approaches), could enhance these methods. Von Hippel and Von Krogh (2016) proposed an alternative problem-solving approach that focuses on discovering viable need-solution pairs without predefining the problem in advance.

In design thinking research, the concept of problem-solving through reflection-in-action has been extensively studied. As Dorst (2019b) observed, when dealing with complex situations, design professionals need "the ability to (repeatedly) frame the complex problem situation, propose possible solutions (moves/gambits) and reflect on the efficacy of both of these" (p. 123). Reflection-in-action aids designers in understanding problems and iterating solutions through a process known as the co-evolution of problems and solutions. This approach allows designers to gain new insights into the problem by exploring potential solutions until a suitable "fit" between the two is achieved (Dorst, 2019a). Additionally, designers can utilise stakeholders' perspectives to inform the design process, continuously refining the design (Zuiker et al., 2023). In this process, reflecting on stakeholders' motivations and interests is essential for fostering empathy and designing effective solutions (Frauenberger et al., 2015).

Building on the above, this paper proposes the following proposition:

Proposition 6: *Managers need to solve problems in value co-creation mechanisms through reflection-in-action.*

Organisation design: evolving organisations

Simon (1996) asserted that if an artefact's internal system is properly designed, it will adapt to its external environment, with its behaviour largely influenced by the changes in that environment. Recognising the limited adaptability of artefacts, Simon recommended that hierarchical organisations, such as companies, should be designed with an evolutionary perspective in mind. He highlighted hierarchical systems consist

of interrelated subsystems at different levels and are nearly decomposable—meaning most subsystems are only weakly connected. Simon (1996, p.196) noted that "complex systems will evolve from simple systems much more rapidly if there are stable intermediate forms [(that is, subsystems or subassemblies)] than if there are not".

Inspired by Simon, Avenier (2010) proposed a constructivism-founded scientific paradigm for organisation research. Sarasvathy (2019) indicated that new ventures emerge from a design process that involves multiple stakeholders and mediates between internal and external environments. Despite these efforts, management and organisation researchers have yet to thoroughly explore organisation design as a social artefact from the perspective of design practice. In design thinking research, the question of how to design an organisation remains largely unexplored. Some areas that have received attention include business model design, innovation process design and the establishment of an organisational culture of innovation (Buchanan, 2015; Salgado et al., 2022). Design research on artefacts primarily focuses on the design process, emphasising the need for designers to view and iterate on artefacts through an evolutionary lens (Dorst, 2019a). Design thinking researchers acknowledge that changes in the market or task environment may prevent designed artefacts from achieving their intended goals (Pandza & Thorpe, 2010; Volkova & Jākobsone, 2016).

Building on the above, this paper proposes the following proposition:

Proposition 7: *Managers need to iterate the design of value co-creation mechanisms from time to time to ensure the company stays competitive in the marketplace.*

Research methodology

Research design

Research approaches can be categorised into three types: quantitative, qualitative and mixed methods. According to Creswell (2003), a qualitative approach typically relies on a constructivist perspective, emphasising multiple interpretations of individual experiences, socially and historically constructed meanings and the intention of developing theories or models. This paper addresses the research question: How can managers design value co-creation mechanisms? To explore this question, this study employed a qualitative research approach to gather data on individual experiences across three key themes: managers as designers, managing as designing and organisation design, with the goal of identifying relevant empirical patterns.

A multi-case study was selected as the research strategy because "case studies are the preferred strategy when ['how'] and ['why'] questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context" (Yin, 2003, p.1). Collecting evidence from multiple cases enhances the study's external validity. According to Yin (2003), a multi-case design should follow a replication logic rather than a sampling logic, meaning that "[the] cases should serve in a manner similar to multiple experiments, with similar results (a literal replication) or contrasting results (a theoretical replication) predicted explicitly at the outset of the investigation" (p. 53). This study does not employ

a theoretical sampling strategy, thus there are no specific requirements regarding the background of the participating companies.

Companies can be categorised into four size classifications: micro enterprise (1–9 persons), small enterprises (10–49 persons), medium enterprises (50–249 persons) and large enterprises (over 249 employees) (European Union Commission, 2003). This classification reflects the typical evolutionary trajectories of companies. Studying the design and evolution of value co-creation mechanisms in large enterprises can be time-consuming and resource-intensive, often leading to challenges in data collection. To ensure the feasibility of the research, the researcher opted to focus on small businesses. Three companies were recruited through the researcher's network for the multi-case study (see Table 1).

Data collection

Interviews served as the primary method of data collection for this study, enabling the researcher to explore individual experiences, opinions, feelings, viewpoints and knowledge (Taylor, 2005). Prior to data collection, both the companies and the interviewees were provided with a research information sheet and required to sign an informed consent form. The companies assisted the researcher in recruiting volunteers for the interviews. For each company, the researcher conducted interviews with all management team members (including the founders), one non-managerial employee and one to three customers. The insights gathered through these interviews offered multiple stakeholder perspectives on three key themes: managers as designers, managing as designing and organisation design. This data allowed the researcher to articulate the evolution of the value co-creation mechanisms in the three companies, drawing on the experiences of diverse stakeholders.

Documents served as a supplementary source for data collection and analysis in this multi-case study. As Briggs et al., (2012, p.297) noted, "documents have been produced and preserved as a record of the past". They provide insights into the research participants' environments and can track changes and developments over time (Bowen, 2009). Furthermore, analysing documents allows researchers to validate findings and corroborate evidence from other sources (Bowen, 2009). The three companies involved in the

Table 1 Company background information

	Company	Size	Industry	Country	Products/services	Year of establishment
Case 1	Company A	Small enterprise (11 persons)	Fashion	China	British-style gentleman's bags and accessories, and design and manufacturing services	2014
Case 2	Company B	Small enterprise (17 persons)	Education	China	Early childhood education (ages 0–6)	2016
Case 3	Company C	Small enterprise (12 persons)	Digital marketing	UK	Search engine optimisation (SEO) and pay-per-click (PPC) services (including training and consulting)	2009

study were asked to supply a range of organisational documents, including employee handbooks, brand manuals, product manuals, organisational structures, workflow diagrams, new product development manuals and market research reports. Their websites (if available) were also considered valuable document sources.

Table 2 lists the sources of interviews and company documents collected for the three case studies.

Strategy and technique used in data collection and analysis

This study employs a strategy of "relying on theoretical propositions" as its overall approach for data collection and analysis. These propositions guided the researcher in focusing on the collection and analysis of relevant data (Yin, 2003). A pattern-matching technique was used to analyse the collected data, which involves "[comparing] an empirically based pattern with a predicted one (or with several alternative predictions)" (Yin, 2003, p. 116). Table 3 summarises the propositions—predicted patterns—from the literature review on how managers can design value co-creation mechanisms. The researcher developed interview questions aimed at testing these propositions based on the collected evidence. Internal interviewees shared their experiences, perceptions, feelings, opinions and knowledge related to their company's management and service provision. In the customer interviews, participants shared their experiences, views, feelings and opinions regarding the company's products and services.

During the writing phase, ChatGPT was used to improve the quality of the English language within this paper.

Multi-case study results

Managers as designers

Predicted pattern 1 (Proposition 1): pattern matching test result

Predicted Pattern 1 (Proposition 1): Managers can be the primary designers of value co-creation mechanisms.

Table 2 Data sources for the three case studies

	Interviews	Company documents
Case 1	Entire management team: 2 people (founder/general manager and operations manager) Non-managerial employee: 1 person (pattern maker) Product brand customers: 3 people	Organisational structure chart, product brand introduction document, company introduction document, marketing material
Case 2	Entire management team: 3 people (founder/general manager, daycare services manager and early education manager) Non-managerial employee: 1 person (administrative) Customers: 3 people	Organisational structure chart, marketing material, product introduction document, departmental timetable
Case 3	Entire management team: 3 people (founder/general manager, operations manager and delivery manager) Non-managerial employee: 1 person (digital marketing analyst) Customer: 1 person	Organisational structure chart, employee handbook, service brochure, company website

Table 3 Three dimensions of management as a design practice and predicted patterns (propositions)

Dimensions	Predicted patterns (propositions)
Managers as designers	Proposition 1: Managers can be the primary designers of value co-creation mechanisms
	Proposition 2: Managers need to develop solutions and make decisions for the problems of value co-creation mechanisms
	Proposition 3: Managers need to facilitate value co-creation through the design of value co-creation mechanisms
Managing as designing: design is a social process	Proposition 4: Stakeholders in value co-creation are also problem-solvers and/or decision-makers
	Proposition 5: The decision-making and problem-solving behaviours of stakeholders in the value co-creation process can be used to evaluate the effectiveness of the value co-creation mechanism and are key factors in its evolution
	Proposition 6: Managers need to solve problems in value co-creation mechanisms through reflection-in-action
Organisation design: evolving organisations	Proposition 7: Managers need to iterate the design of value co-creation mechanisms from time to time to ensure the company stays competitive in the marketplace

Case 1 (Data sources: interviews with the founder and operations manager): The founder of Company A positioned its product brand's value proposition as affordable British-style luxury bags and accessories for men, targeting at a niche market of Chinese male elites who appreciate British gentleman aesthetic. She developed the company's core competences in bag design and brand strategy, crafted the organisational structure and business processes, and established partnerships with factories to outsource production capabilities. Additionally, she built a resource network and cultivated relationships with various stakeholders, including distribution channels.

Case 2 (Data sources: interviews with the founder, daycare services manager, early education manager and a non-managerial employee): The founder of Company B offered Montessori curriculum products and services to the local early childhood education market for children aged 0–6. She built and developed her team, created the organisational structure and internal business processes, and collaborated with external stakeholders, such as event organisers and local business partners, to organise marketing activities while establishing strong relationships with clients. The founder emphasised the importance of a "personalised approach", prioritising children's well-being and fostering communication with parents. All four internal interviewees reported applying this approach in their work.

Case 3 (Data source: founder interview): The founder of Company C served as the primary designer of his company. He oversaw various areas, including company strategy and planning, business development and sales, market research and service improvement. At the company's inception, he prioritised offering data-driven digital marketing services. In 2016, he repositioned the company as a data-driven and human-centred digital marketing agency. He gradually expanded the company's market reach, extending operations from Northern England to the South and from the domestic market to international markets. The founder built a dedicated employee team and fostered a customer-centric corporate culture. Additionally, he was responsible for developing the company's resource network and forming partnerships with

stakeholders, including clients, local business councils, digital marketing expo organisers, public relations agencies and web design companies.

In summary, the founders of all three companies served as the primary designers of their companies' value co-creation mechanisms. They were responsible for constructing, designing and developing essential components such as brand strategy, product-market strategy, core competencies, organisational structure, business processes and service delivery. Each founder adopted a multi-stakeholder approach in designing these mechanisms and outsourced non-core capabilities to external resource networks. This aligns with Proposition 1, "Managers can be the primary designers of value co-creation mechanisms".

Predicted pattern 2 (Proposition 2): pattern matching test result

Predicted Pattern 2 (Proposition 2): Managers need to develop solutions and make decisions for the problems of value co-creation mechanisms.

Case 1 (Data sources: interviews with the founder and operations manager): The founder of Company A encountered challenges in collaborating with external stakeholders, particularly factories and distribution channels, during the value co-creation process. The company's limited financial resources and modest production needs made it difficult to negotiate production adjustments with factories. Over 3 years, Company A worked to establish stable relationships with factories to resolve production issues. The ultimate solution was to form a close partnership with one factory, creating a joint studio. This collaboration led to a highly adaptive production process capable of swiftly responding to changing market demands and significantly enhanced Company A's inter-organisational processes with its distributors. Internally, the founder faced operational inefficiencies due to unclear roles within the initial management team. To address this, she established a clear division of responsibilities between herself and the operations manager. Specifically, the founder concentrated on product design, business development, client management and daily operations, while the operations manager, who is also the factory owner, managed production, processing, material preparation and quality control. This clear delineation of roles enhanced operational efficiency.

Case 2 (Data sources: interview with the founder and department timetable): Company B faced challenges in daily operations and management due to a lack of formal rules and responsibilities, which led to employees feeling unmotivated to contribute to the company's development. In response, the founder decided to design formal business processes, establish formal departmental rules and responsibilities and foster a strong corporate culture. By the time data were collected, these adjustments had proven effective. She created a daycare department timetable outlining the daily workflow of the daycare services, clarifying the tasks and responsibilities of teachers, assistant teachers and classroom aides, as well as how they should collaborate. The founder also organised regular team training sessions to motivate the staff.

Case 3 (Data source: interview with the founder): The founder of Company A noted that customers often make purchasing decisions only after thoroughly understanding the services offered. To address this, he organised multiple training sessions to showcase the company's offerings. In 2017, he decided to extend the company's market reach to Southern England by opening an office in London. This expansion aimed to provide

clients with face-to-face communication and a more personalised service. For example, the company could offer customised PPC training to London clients. These training sessions also served as opportunities to encourage clients to explore and purchase additional services.

In summary, the founders of all three companies had to devise solutions and make decisions about regarding the design of value co-creation mechanisms. The process involved identifying and understanding the challenges to effective value co-creation, selecting specific issues to tackle, researching, designing and implementing solutions and evaluating their effectiveness in achieving value co-creation goals. This supports Proposition 2: "Managers need to develop solutions and make decisions for the problems of value co-creation mechanisms".

Predicted pattern 3 (Proposition 3): pattern matching test result

Predicted Pattern 3 (Proposition 3): Managers need to facilitate value co-creation through the design of value co-creation mechanisms.

Case 1 (Data sources: interviews with the founder and operations manager): After establishing a joint studio in partnership with a factory, Company A needed to design a new internal organisational structure, processes and business model in collaboration with the factory. The founder of Company A and the factory's owner, who also served as the operations manager of the joint studio, dedicated several months to complete these design tasks related to the value co-creation mechanism. By the time data were collected, Company A's service chain encompassed product design, material selection, pattern making, sample creation, manufacturing, sales and marketing, material preparation, packaging, logistics and after-sales service. Internally, the founder focused on product design and coordinated the production process with the operations manager while also establishing distribution channels and overseeing after-sales service. Company A's products were primarily delivered to customers through third-party distribution channels that had established customer and media networks.

Case 2 (Data sources: interviews with the founder and early education manager): The founder of Company B oversaw all aspects of the company, including operations, student enrolment and teaching. She established a customer-centric philosophy throughout the organisation, emphasising close collaboration with clients and adapting to their specific and evolving needs. For example, the early education manager needed to explain to clients why certain new courses may or may not be introduced for their children. Additionally, the founder identified a lack of familiarity with Montessori education among local parents. To address this, she implemented marketing campaigns to raise awareness about the company's offerings and provided staff training to ensure they could effectively communicate with both current and prospective clients. Internally, the founder introduced new rules and regulations to motivate employees and drive the company's growth.

Case 3 (Data sources: all interviewees, employee handbook, service brochure and official website): The founder of Company C established a customer-centric philosophy within the organisation. Internal interviews show that all interviewees had a strong grasp of this philosophy and applied it in their daily work. Company C encouraged employees to actively contribute to enhancing company workflows and task execution: this was written in the employee handbook. Externally, Company C communicated its

customer-centric approach through its service brochure and official website. The service brochure outlines how the company uses its expertise to benefit clients through inter-organisational processes and highlights its ability to adjust forecasting to align with clients' evolving marketing goals. Client interviews revealed that they engaged in monthly discussions with Company C about their business needs and made decisions about their website and SEO based on Company C's advice.

In summary, the founders of all three companies recognised the necessity of promoting value co-creation through the design of effective mechanisms. This involved creating a customer-centric company culture and developing organisational structures, intra and inter-organisational processes, business models, service delivery methods, employee training programmes and marketing activities that foster value co-creation. A key focus was on engaging both internal and external stakeholders in the design and enhancement of these mechanisms. Therefore, Proposition 3, "Managers need to facilitate value co-creation through the design of value co-creation mechanisms", is supported.

Managing as designing

Predicted pattern 4 (Proposition 4): pattern matching test result
Predicted Pattern 4 (Proposition 4): Stakeholders in value co-creation are also problem-solvers and/or decision-makers.

Case 1 (Data sources: interviews with the founder and operations manager): Company A's experience underscores that value co-creation is a dynamic social process involving various stakeholders, each acting as decision-makers and problem-solvers. Internal stakeholders focused their decision-making and problem-solving efforts on advancing value co-creation. For example, the founder of Company A sought a partnership with the factory to overcome production challenges and improve value co-creation efficiency. External stakeholders, on the other hand, often acted in alignment with their own interests. For example, the founders of Company A and its partner factory formed a joint studio and co-designed a business model, with the factory founder leveraging the collaboration to build his product brand and address shortcomings in design and brand strategy.

Case 2 (Data sources: interviews with the early education manager and customers): The data from Company B further illustrate that stakeholders in the value co-creation process take on roles as decision-makers and problem-solvers. Internal stakeholders primarily focused on facilitating and promoting value co-creation. For example, the early education manager noticed that parents' interest declined after repeatedly attending the same courses, resulting in decreased student attendance. To address this, she communicated with parents to assess whether new courses should be introduced for their children and to identify the most suitable options. On the other hand, parents' decisions and problem-solving actions were driven by their children's benefits. One parent, for example, was drawn to Company B's location and environment but had reservations about the service quality. She noted, "I thought, why not give it a try? You have to take the first step to see if it's good or bad. If I have any concerns, I'll bring them up".

Case 3 (Data sources: interviews with the operations manager, delivery manager, a non-managerial employee and a customer): The interviewed employees and customers of Company C were both problem-solvers and decision-makers. The decision-making and

problem-solving behaviours of the three employees were related to facilitating value co-creation. The operations manager described handling unforeseen client-related issues by listening carefully, understanding the problems and using his expertise to address them effectively. The delivery manager shared an experience from his time as a copywriter, where he observed that the content previews he created for clients were being truncated on Google's preview page. After conducting some research, he discovered an effective solution. Customer interview data revealed that their decision-making and problem-solving behaviours were focused on integrating resources to meet their own goals—they wanted to partner with digital marketing companies to enhance their Google rankings and boost revenue.

In summary, both internal and external stakeholders from the three companies show problem-solving and decision-making behaviours related to value co-creation. This supports Proposition 4 "Stakeholders in value co-creation are also problem-solvers and/or decision-makers".

Predicted pattern 5 (Proposition 5): pattern matching test result

Predicted Pattern 5 (Proposition 5): The decision-making and problem-solving behaviours of stakeholders in the value co-creation process can be used to evaluate the effectiveness of the value co-creation mechanism and are key factors in its evolution.

Case 1 (Data sources: founder and operations manager interviews): Fig. 2 illustrates two examples of how external stakeholders' decision-making and problem-solving behaviours influenced the evolution of Company A's value co-creation mechanism. In the first example, factories chose not to prioritise Company A's production requests, exposing inefficiencies in the company's value co-creation process. However, one factory decided to collaborate with Company A by establishing a joint studio, which introduced a new business model that allowed the factory to prioritise Company A's production needs. In return, Company A provided support in design and brand strategy to help the factory expand its own product and service offerings. This collaboration significantly enhanced the effectiveness of Company A's value co-creation mechanism. In the second example, Company A encountered ongoing challenges
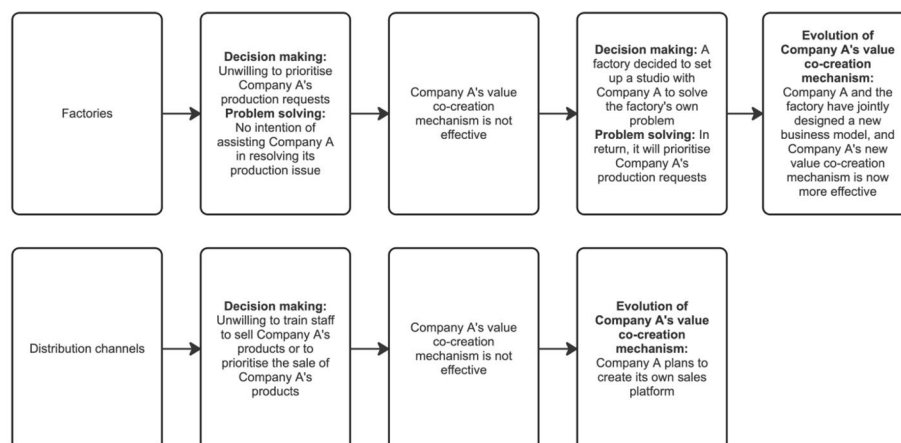

Fig. 2 The evolution of Company A's value co-creation mechanism influenced by stakeholders' decision-making and problem-solving behaviours

with its distribution channels. Most distributors were multi-brand stores that struggled to train staff effectively on promoting Company A's brand. As the founder was unable to persuade distributors to prioritise her brand, she decided to create her own sales platform.

Case 2 (Data sources: interviews with the founder, daycare services manager, early education manager and employees): Fig. 3 illustrates two examples of how internal stakeholders' decision-making and problem-solving behaviours influenced the evolution of Company B's value co-creation mechanism. The first example shows that employees' decision not to contribute to Company B's development prompted the founder to establish formal rules, responsibilities and a corporate culture. The second example highlights Company B's training programmes, which primarily focused on the curriculum but failed to sufficiently equip teaching staff with the necessary knowledge and skills for their roles. Consequently, many staff members had to source materials and learn independently in their spare time. Recognising this gap, the daycare services manager planned to develop dedicated training programmes for teaching staff.

Case 3 (Data source: employee handbook): Fig. 4 illustrates how employees' decision-making and problem-solving behaviours shaped the evolution of Company C's value co-creation mechanism. Company C equipped all employees with a comprehensive employee handbook that outlines internal processes, external procedures and best practices. The handbook encourages employees to report any ineffective processes or suggest software replacements or improvements for task execution. This system allows them to notify the person responsible for updating the handbook, facilitating the implementation of necessary changes. By doing so, the company promotes active participation from all employees in enhancing its value co-creation mechanism.

The findings from all three case studies affirm Proposition 5: "The decision-making and problem-solving behaviours of stakeholders in the value co-creation process can
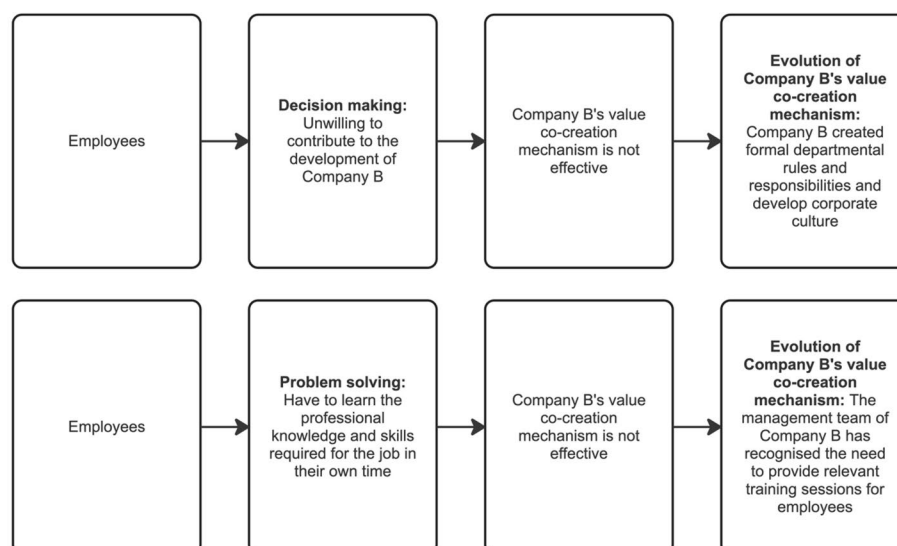

Fig. 3 The evolution of Company B's value co-creation mechanism influenced by stakeholders' decision-making and problem-solving behaviours
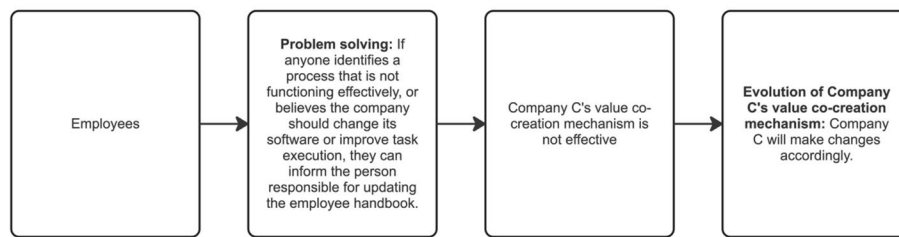
Fig. 4 The evolution of Company C's value co-creation mechanism influenced by stakeholders' decision-making and problem-solving behaviours

be used to evaluate the effectiveness of the value co-creation mechanism and are key factors in its evolution". Case 1 presents data from external stakeholders, while Cases 2 and 3 offer insights from internal stakeholders.

Predicted pattern 6 (Proposition 6): pattern matching test result

Predicted Pattern 6 (Proposition 6): Managers need to solve problems in value co-creation mechanisms through reflection-in-action.

Case 1 (Data sources: interviews with the founder and operations manager): The founder of Company A spent 3 years searching for a solution to the production challenge. In negotiating with the factories, she recognised the core issue: "[Our] brand is new, our company is relatively small, and our financial capacity is limited, and we want to produce a limited number of products. Therefore, it's difficult to establish relationships with factories." After 3 years exploration, the founder successfully resolved the issue: "I have built relatively stable relationships with upstream channels, that is, a factory, and established partnerships with them. We developed a new business model and adjusted the production and design rhythm". This solution was achieved because the factory owner sought to leverage the design and branding expertise of Company A's founder to develop new products and services.

Case 2 (Data source: founder interview): The founder of Company B initially focused on building strong relationships with employees through a personal approach to management. However, she soon realised that this approach alone did not ensure accountability or motivate employees to work with enthusiasm. To address this issue, she decided to complement this approach with formal rules and regulations, placing particular emphasis on a system of rewards and penalties. The initial changes proved effective, prompting the founder to further formalise departmental regulations and responsibilities. Additionally, she introduced a new company mission: "To help our teachers continue to grow; to be talented, confident, and well-paid." The founder supported employees in understanding how to apply their professional skills for the benefit of customers through various means, including internal training programmes, meetings, course materials, daily communications and company documents.

Case 3 (Data source: founder interview): The founder of Company C mentioned:

> *The biggest challenge for [the company] is actually hiring people, finding good people to do the job, who have resilience, the determination, and essentially the grit to stay the course and to realise that this is a challenging industry because we don't dictate the success of our clients, our clients businesses and the position in the market-*

place, and some extreme factors that actually come into play, um, it's so difficult to do what we do. Sometimes employees find it challenging, too challenging sometimes and then then leave. It's also a case that we are quite different to other businesses. So, finding people that, understand that, and are willing to do things slightly differently to the norm is a challenge. ... So, how do we overcome this? ... We hire people in apprenticeship roles, and we hire people straight out of university who perhaps haven't got the industry experience, so we can train them and model them in the way of thinking that we work.

The findings from the three case studies support Proposition 6: "Managers need to solve problems in value co-creation mechanisms through reflection-in-action". Each cases illustrates the complex, or "wicked", nature of certain management and organisation design challenges. These challenges align with characteristics identified by Rittel and Webber (1973), such as "solutions ... are not true-or-false, but good-or-bad", "no immediate and no ultimate test of a solution", "every wicked problem is essentially unique" and "every wicked problem can be considered to be a symptom of another problem" (pp. 162–165). For example, in the case of Company A, its poor market performance serves as a symptom of underlying production, distribution and resource challenges. Addressing these issues require managers to engage in reflection-in-action, which involves forming an initial understanding of the problem, exploring and selecting solutions, implementing those solutions, evaluating their effectiveness and developing new insights. Managers must then decide whether to continue with the existing solution or seek alternatives. The understanding of both problems and solutions can evolve concurrently. For instance, the founder of Company A realised that merely trying to establish stable relationships with factories would not resolve the production issue; the root of the problem lay in the conflicting interests between her company and the other party. This highlighted the necessity for a deeper understanding of the problem while exploring possible solutions. Ultimately, she decided to collaborate with a factory to set up a studio that would provide additional resources, thus securing the factory's support for her production needs—achieving a good fit between the problem and solution. This illustrates that solutions are not always immediately apparent, and it often takes time to identify the core issue that must be addressed first, understand the differing interests of multiple stakeholders in value co-creation and find potential points of alignment.

Organisation design: results of the pattern matching test for predicted pattern 7 (Proposition 7)

Predicted Pattern 7 (Proposition 7): Managers need to iterate the design of value co-creation mechanisms from time to time to ensure the company stays competitive in the marketplace.

Case 1 (Data sources: founder interview and organisational structure chart): The initial market positioning of Company A's product brand began losing its competitive edge as China's sales channels diversified, allowing customers to purchase foreign luxury brands at lower prices. Some potential customers expressed dissatisfaction with the cost-effectiveness of Company A's products, opting instead for more well-known luxury brands. In response, Company A expanded into the Business-to-Business (B2B) custom services market, offering Original Design Manufacturer (ODM), Original Equipment

Manufacturer (OEM) and production manufacturing services to organisational clients. This strategic shift leveraged the founder's design expertise, and the production capabilities secured through the joint studio partnership with a factory. The introduction of these custom services attracted larger orders from organisational clients, allowing Company A to supply products to their end customers. This move enhanced the company's value co-creation mechanism and strengthened its market competitiveness. With stable production capacity in place, the founder planned to establish proprietary Business-to-Customer (B2C) sales channels to further enhance the company's sales capabilities.

Case 2 (Data sources: interviews with the founder and daycare services manager): Early childhood education is a rapidly growing industry in China, requiring Company B's employees to continually update their expertise, including staying current with the frequently changing registration policies. To support this, the founder of Company B organised three to four annual training sessions led by external course providers. Additionally, she held regular training sessions to help staff deepen their knowledge and skills in Montessori education. Looking ahead, to better serve its customers and stay competitive, Company B will need to provide ongoing training for employees in early childhood education, childcare knowledge and teaching techniques.

Case study 3 (Data sources: founder interview and official website): Company C initially focused on data-driven SEO and PPC solutions, but as competitors began adopting similar data-centric strategies, the founder devised a new approach. The company shifted its emphasis to a more people-centred strategy, leveraging empathy to better understand the target audience's behaviour and applying these insights to drive data-informed marketing activities. Company C's updated strategy also highlighted close collaboration with clients, tailoring services to meet their unique needs. The founder introduced a new vision for the company: "Our aim is to be the UK's leading Data-driven and Psychology-based SEO and PPC agency". This was complemented by a revised value proposition: "[We create] realistic data-driven strategies that bring long-term, stable returns, not unstable, expensive results. We make your online presence stronger and increase your income". This new vision and value proposition are supported by Company C's core competences, particularly its team's expanding expertise in search engine algorithms, advertising policies and customer behaviour trends.

The data from the three cases demonstrate that the evolution of value co-creation mechanisms is closely tied to their ability to adapt to external market environment, with stable subsystems or subassemblies forming as a crucial foundation for this process. In Cases 1, 2 and 3, the company's core resources—specialised knowledge and skills—serve as key stable subassemblies that drive the development of these mechanisms. Findings from Cases 1 and 3 show that when the market conditions shift, previously effective value co-creation mechanisms may fail to consistently achieve their intended outcomes. In such situations, it becomes necessary for the founder to modify the original design, including business models and value propositions, and introduce new core resources—such as specialised knowledge and skills—to enable the mechanism's evolution. Data from Case 1 highlight that this evolution results from a design process involving multiple internal and external stakeholders. In conclusion, evidence from the three case studies supports Proposition 7: "Managers need to iterate the design of value co-creation mechanisms from time to time to ensure the company stays competitive in the marketplace".

Predicted pattern matching test results and design framework

This study explores three themes of management as a design practice through a multi-case study approach: managers as designers, managing as designing and organisation design. It conceptualises companies as artefacts, with value co-creation mechanisms serving as the internal systems that require design. Within this framework, the multi-case study provides detailed insights into how the founders of three companies design and adapt these mechanisms in response to the external environment. All seven predicted patterns (propositions) were supported (see Table 4). These propositions address the research question: How can managers design value co-creation mechanisms? Together, they form a design framework that can guide managers in the task of designing value co-creation mechanisms.

Discussion

Managers as designers

Many studies have examined the role of managers as decision-makers and problem-solvers—essentially, as designers (Boland et al., 2008; Frisk & Bannister, 2017). This study expands on that discussion by presenting empirical evidence from three case studies, highlighting the three key roles that company founders play in designing and developing value co-creation mechanisms: designers, managers and facilitators.

The multi-case study reveals that the three company founders served as key designers of value co-creation mechanisms, shaping their companies' brand strategies, product-market strategies, core competencies, organisational structures, business processes and service delivery. In developing these mechanisms, they embraced a multi-stakeholder approach and outsourced non-core functions to external resource networks. This finding underscores the importance of managers as key designers of value co-creation, highlighting that the design of these mechanisms requires a multi-stakeholder perspective (Kim & Choi, 2019; Lambert & Enz, 2012; Saarijärvi et al., 2013). Additionally, the three

Table 4 Predicted patterns (propositions) test results/value co-creation mechanism design framework

Dimensions	Predicted patterns (propositions)	Test results
Managers as designers	Proposition 1: Managers can be the primary designers of value co-creation mechanisms	Supported
	Proposition 2: Managers need to develop solutions and make decisions for the problems of value co-creation mechanisms	Supported
	Proposition 3: Managers need to facilitate value co-creation through the design of value co-creation mechanisms	Supported
Managing as designing: design is a social process	Proposition 4: Stakeholders in value co-creation are also problem-solvers and/or decision-makers	Supported
	Proposition 5: The decision-making and problem-solving behaviours of stakeholders in the value co-creation process can be used to evaluate the effectiveness of the value co-creation mechanism and are key factors in its evolution	Supported
	Proposition 6: Managers need to solve problems in value co-creation mechanisms through reflection-in-action	Supported
Organisation design: evolving organisations	Proposition 7: Managers need to iterate the design of value co-creation mechanisms from time to time to ensure the company stays competitive in the marketplace	Supported

case studies contribute to the discourse on value co-creation mechanisms by introducing design elements such as product-market strategies, organisational structures and business processes (Saarijärvi et al., 2013).

The three cases demonstrate that company founders or general managers must create solutions and make decisions regarding the design of their value co-creation mechanisms. This process involves identifying and overcoming barriers that hinder the efficient functioning of these mechanisms, with the ultimate goal of achieving value co-creation. This finding aligns with traditional management science theories, which emphasise problem-solving as a core element of decision-making (Comfort & Wukich, 2013; Drucker, 1955; Simon, 1996). Furthermore, it underscores the need for managers to adopt both a "decision attitude" and a "design attitude" toward innovation and improvement when developing value co-creation mechanisms (Comfort & Wukich, 2013; Frisk & Bannister, 2017). For larger companies, establishing specific value co-creation processes or frameworks tailored to distinct tasks can enhance managers' ability to recognise problems and formulate solutions, thereby improving decision-making effectiveness (Frow et al., 2015). Nevertheless, the case studies presented in this paper reveal the complexities that arise in management practice, often requiring managers to adopt more creative approaches to problem-solving. In such cases, it is critical to develop appropriate cognitive models and tools, such as the Design Council's Double Diamond design thinking model, to support managers in navigating challenges and making informed decisions (Kochanowska & Gagliardi, 2022; Tschimmel, 2012).

This study provides empirical evidence demonstrating how company founders and general managers can facilitate value co-creation through the design of effective value co-creation mechanisms. It revealed that a crucial factor in this process is empowering both internal and external stakeholders to actively engage not only in value co-creation itself, but also in the design and enhancement of these mechanisms. This aligns with the concept of the designer as a facilitator, as proposed by design thinking scholars (Mosely et al., 2021; Trischler et al., 2019) and resonates with the emphasis in management and organisational research on the importance of employee participation in organisation design (Visscher & Fisscher, 2012). Data from three distinct industries demonstrate that the design of value co-creation mechanisms must be tailored to specific industry characteristics (Frow et al., 2015).

Finally, the three cases suggest that founders or general managers can establish a management team to share responsibility for these tasks. Together, they can develop solutions and make decisions regarding the design of value co-creation mechanisms, thereby fostering value co-creation. For example, in Company A, the founder worked alongside the operations manager to design the value co-creation mechanism. In Company B, the daycare services manager proposed introducing internal training courses, illustrating how the management team can leverage their expertise to support the primary designer in refining the value co-creation mechanism.

Managing as designing

The three case studies illustrate that value co-creation is a dynamic social process where both internal and external stakeholders play crucial roles as problem-solvers and decision-makers. The success of value co-creation hinges on their active involvement.

Specifically, the decision-making and problem-solving behaviours of internal stakeholders help drive value co-creation, while external stakeholders' actions are more focused on realising their own objectives. These behaviours not only serve as a way to evaluate the effectiveness of value co-creation mechanisms, but also play a key role in shaping their evolution. These insights align with design research on the social and contingent nature of design activities, the limited control designers have over outcomes, and the view from design and management scholars that organisations are socially constructed designs (Aguirre et al., 2017; Andersen & Mosleh, 2021; Buchanan, 2015; Morosanu & Crilly, 2018; Romme, 2003; Sarasvathy, 2019; Van Aken, 2005).

The case studies highlight that managers can effectively tackle challenges related to value co-creation by understanding the context of problems, concentrating on solutions and actively involving stakeholders. Internally, stakeholders face and recognise system issues pertinent to their roles. The data demonstrate the benefits of empowering employees in organisational decision-making when designing value co-creation mechanisms, as this approach enables them to leverage resources (including information, knowledge and skills) to solve problems and facilitate value co-creation. When interacting with external stakeholders, designers of value co-creation mechanisms can follow the advice of Visscher and Fisscher's (2012) to intentionally leave organisational designs open-ended, which facilitates connections with external stakeholders and enhances value co-creation. For instance, both Company B and Company C can modify their services in response to evolving customer needs.

It is important to note that most existing research on design methods and practices concentrates on the collaborative design activities of stakeholder within set time and space scales (Andersen & Mosleh, 2021). Only a handful of studies offer empirical insights into the long-term design and evolution of organisations as artefacts from a multi-stakeholder perspective (Garg, 2017). This study reveals that addressing challenges related to value co-creation often hinges on ongoing social interactions and learning processes among various internal and external stakeholders. The ability to resolve these challenges is closely tied to the internal system's capacity to adapt to the external environment, which can result in either incremental or radical innovations within the value co-creation mechanisms. Incremental innovations may encompass enhancements at the product, service and process levels, as seen in Company B's implementation of new regulations and refined workflows and Company C's adjustments to product value propositions (Szekely & Strebel, 2013). In contrast, radical innovations generally involve a wider array of activities and deeper engagement with suppliers and other stakeholders, exemplified by Company A's partnership with a factory to establish a studio, shift business models and broaden product market reach (Szekely & Strebel, 2013).

Pandza and Thorpe (2010) introduced two approaches to organisational design for managers, drawing an analogy with engineering design: management as path-dependent design and management as path-creating design. The path-dependent design approach highlights how incremental adaptations and repetitive evolutionary patterns impact design decisions and foster the incremental development of artefacts, acknowledging that organisational growth follows a lifecycle trajectory. This approach aligns with the evolutionary trends seen in Companies B and C. Conversely, the path-creating design approach emphasises innovation and the exploration of uncertainty, showcasing the

complex and multi-centred nature of developing socially constructed products. For instance, Company A's partnership with a factory to establish a studio and revise its business model illustrates this path-creating design. Pandza and Thorpe (2010) asserted that both approaches focus on understanding the agency of individual designers or designer networks. This study suggests that founders, as the primary designers of value co-creation mechanisms, must lead relevant design initiatives and actively involve internal and external stakeholders in the design process. More empirical research is needed to investigate participatory design and co-design within the evolution of value co-creation mechanisms.

This study reveals that many challenges associated with value co-creation mechanisms are wicked problems, necessitating managers to engage in reflection-in-action to address them. According to Dorst (2019a, p.60), professional designers must "[re-interpret] design problem in the light of an exploration of possible solutions until a good 'fit' between problem and solution"—a process known as the co-evolution of problem and solution. This approach was similarly adopted by the designers of value co-creation mechanisms in the three cases. For instance, the case of Company A demonstrates that resolving complex problems often requires the initial identification and tackling of core sub-problems. In this process, comprehending the differing interests of key stakeholders in value co-creation and recognising potential areas of alignment can lead to viable and effective solutions. When resources are constrained, resolving these core sub-problems establishes a foundation for addressing related challenges. Additionally, value co-creation entails the interaction and resource integration of all participants to achieve mutual benefits. The case studies emphasise that successful solutions hinge on managers actively reflecting on the motivations and interests of stakeholders, which enables them to empathise with their behaviours, identify areas of alignment and design effective solutions that are mutually acceptable (Frauenberger et al., 2015).

Organisation design

The three case studies indicate that managers need to continuously iterate the design of value co-creation mechanisms to maintain the company's competitiveness in the market. These changes can be classified into two types:

- The first type of change focuses on improving the design of the company's internal environment and systems to ensure smooth operations and enhance efficiency. For instance, Company A introduced a clear division of responsibilities, Company B implemented well-defined departmental rules and work schedules and Company C encouraged employees to contribute suggestions for enhancing workflows and processes.
- The second type of change involves adapting the value co-creation mechanism to the external environments and shifts in those environments. For example, in response to growing competition in in the B2C market, Company A partnered with a factory to create a new business model and transition into the B2B market. Similarly, Company C adjusted its brand strategy and value proposition to differentiate itself from competitors in a saturated market, offering training and in-person services to attract customers.

These findings align with Simon's (1996) recommendation to approach artefact design from an evolutionary standpoint, addressing their inherent adaptability constraints. They further support Sarasvathy's (2019) argument that new ventures, as social artefacts, are the outcome of a design process involving multiple stakeholders and mediating between internal and external environments.

Figure 5 presents a schematic diagram of the value co-creation mechanism (internal company system) and the value co-creation network (external environment). It illustrates several key findings from this study regarding value co-creation mechanisms as artefacts: (1) managers serve as designers, managers and facilitators of the mechanism; (2) the mechanism operates as an internal system, where internal stakeholders acts as problem-solvers and decision-makers, facilitating value co-creation; (3) the external environment forms the value co-creation network, where stakeholders also engage as problem-solvers and decision-makers, pursuing their own interests.

Additionally, the three case studies underscore the vital role of stable subsystems or subassemblies in organisational evolution (Simon, 1996). A company's core resources, including specialised expertise and skills, serves as these stable subsystems or subassemblies for the evolution of value co-creation mechanisms. They provide a foundation for adapting other subsystems to better align with market conditions. For small companies
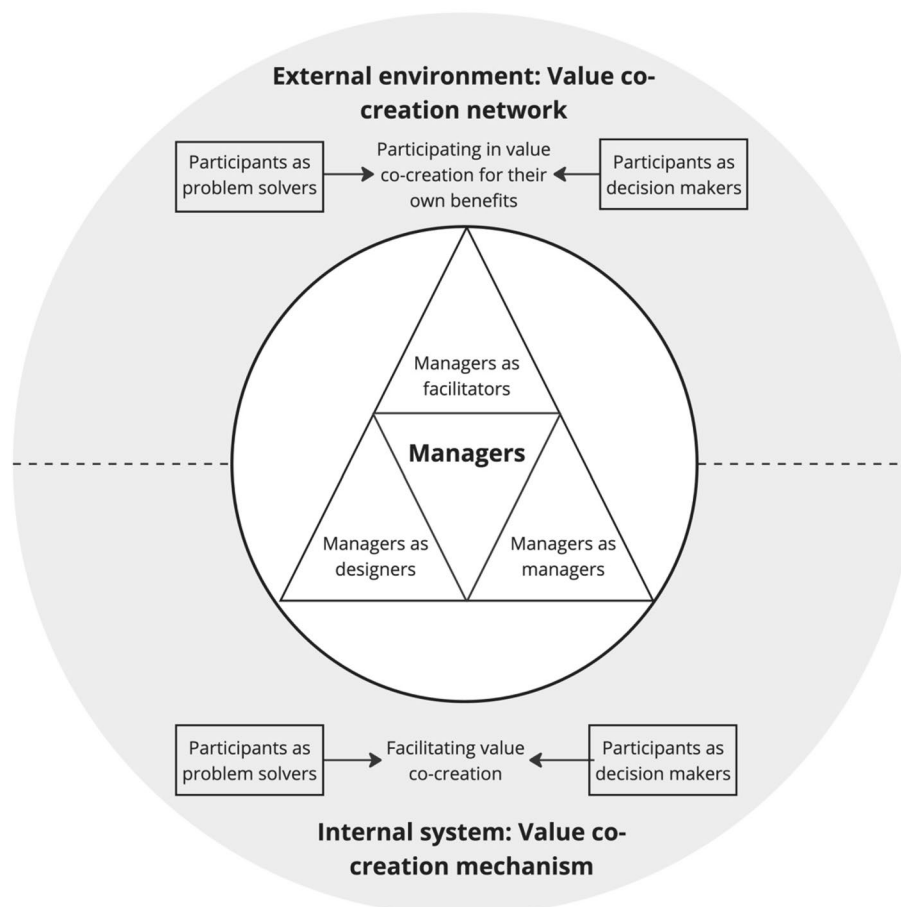
Fig. 5 Value co-creation mechanism (internal system) and value co-creation network (external environment) diagram

with limited resources, establishing and cultivating their core competences is essential for survival in a highly competitive landscape and for participating in a broader value co-creation network.

In summary, when value co-creation mechanisms face challenges in adapting to the market environment, the founder or general manager must revise existing designs—such as business models and value propositions—and integrate new core competences to drive the evolution of these mechanisms.

Conclusions

In recent years, a discourse has emerged within management advocating for the conceptualisation of management as a design science to bridge the divide between research and practice. This viewpoint seeks to redefine the hypotheses of management and organisation research as design propositions or technical rules, highlighting the importance of conducting prescription-driven management research (Romme, 2003; Van Aken, 2005). Researchers assert that these design propositions can be derived from descriptive organisation studies and tested in real-world contexts, similar to traditional engineering problem-solving approaches (Pandza & Thorpe, 2010; Romme & Dimov, 2021; Tanskanen et al., 2017).

This paper argues that many management and organisational challenges are wicked problems that cannot be addressed through rational and systematic methods. As Rittel and Webber (1973) pointed out, the complex nature of these issues renders the search for a scientific basis for solving wicked problems fundamentally flawed. Thus, any attempt to apply conventional scientific approaches to these challenges is likely to be unsuccessful. Drawing from their insights, the design research community has shifted its focus from merely studying design methods to understanding how professional designers effectively address problems in practice (such as through design thinking), rather than attempting to scientise the practice of design itself (Dorst, 2019b; Kimbell, 2009). Inspired by these design studies, this paper introduces a new concept of "management as a design practice" and advocates for a pragmatic philosophical approach to conducting and studying management practices.

This study explores three key themes of management as a design practice through a literature review and multi-case study: managers as designers, managing as designing and organisation design. The study specifically focuses on the design of value co-creation mechanisms within companies as a distinct organisation design task. The findings reveal the complex and wicked nature of management and organisation design challenges, particularly in the context of uncertain or rapidly changing external environments. This underscores the necessity of viewing management not only as a design science, but also as a design practice. Furthermore, the multi-case study underscores the significance of viewing organisations as social artefacts influenced by the decision-making and problem-solving actions of various stakeholders. The findings highlight that understanding the manager's roles as designer, manager and facilitator is crucial for effective organisation design. Building on these insights, this study presents a design framework that assists managers in designing and managing value co-creation mechanisms. This framework provides an initial understanding of the design processes involved, stakeholder engagement and the evolution of these mechanisms.

This study investigates the design and evolution of value co-creation mechanisms in three small companies. Managers in medium- and large-sized companies may encounter more complex challenges in designing and managing these mechanisms, which require further investigation. In the cases analysed in this study, the founders serve as the primary designers of their value co-creation mechanisms. In organisations led by professional managers, there exists an opportunity to avoid making risky decisions that might primarily benefit the owners. Empirical research is needed to distinguish the decision-making approaches of managers from those of owners. Additionally, this paper briefly discusses innovative theories such as incremental and radical innovation, as well as management as path-dependent and path-creating design. In the future, the triple helix, quadruple helix and quintuple helix innovation models may also be employed to explore innovations in value co-creation mechanisms, the evolution of companies as service systems and the interactions within multi-actor service ecosystems.

Contributions to knowledge

This paper makes two major contributions to knowledge. First, it expands the discourse on management as a design science, offering management and organisation researchers with a new lens through which to view management and organisation design as design practices. It is essential for researchers to recognise that, in many instances, managers must act as pragmatists when addressing wicked problems related to management and organisation design. Therefore, management and organisation research should study these practices, generating insights that can effectively bridge the gap between theory and practice. Second, bolstered by empirical data, this paper enhances the ongoing discussion regarding the value of design thinking for managers. Current research on design thinking presents a variety of promising themes for future exploration in management and organisation studies. These themes include approaches for engaging multiple stakeholders in the design process and the development of design tools to facilitate effective design. This paper suggests that researchers exploring management and organisation design practices should consider adopting Simon's (1996, p. 111) broad definition of a designer as "[everyone] designs who devises courses of action aimed at changing existing situations into preferred ones". Furthermore, as noted by Nigel Cross (Cross, 1982), designing complex artefacts is seldom a purely scientific process, yet we can use scientific methods to understand the design process. This viewpoint provides valuable insights for future research on management and organisation design practices.

Availability of data and materials

The datasets generated and/or analysed during the current study are not publicly available as they contain commercially confidential information but are available from the corresponding author on reasonable request.

Declarations

Informed consent

Ethical approval was obtained for the collection of data for this study, and both the participating companies and respondents were provided with a research information sheet and signed an informed consent form prior to data collection.

Competing interest

The author declares that she has no competing interests.

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