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DIGITAL
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Design and Innovation for Made in Italy

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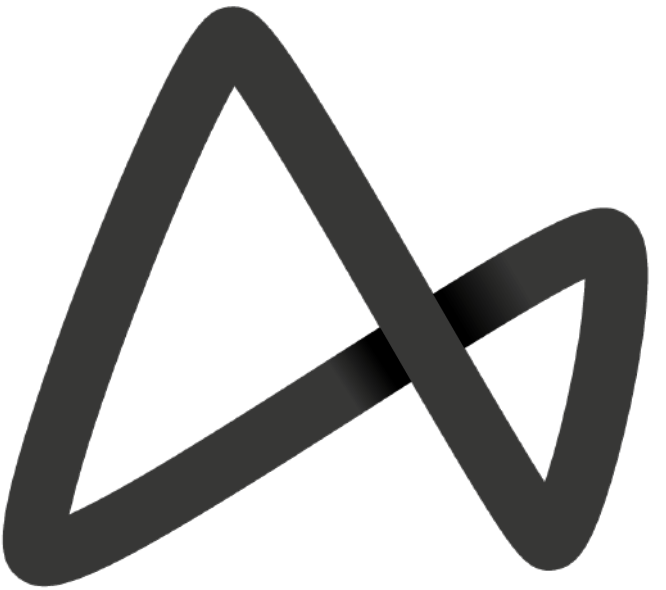

Colophon

diid
disegno industriale
industrial design
Digital Special Issue 3

Year
XXIII

diid is an open access
peer-reviewed scientific
design journal

diid is published
three times a year

Registration at Tribunale
di Roma 86/2002
(March 6, 2002)

www.diid.it

Publisher
Fondazione
Bologna University Press
Via Saragozza 10
40123 Bologna
Tel. (+39) 051 232 882
Fax (+39) 051 221 019
www.buponline.com
info@buponline.com

ISSN
1594-8528

ISSN Online
2785-2245

DOI
10.30682/diidmics25

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The Design and Innovation for Made in Italy diid Digital Special Issue have undergone a rigorous peer-review process to ensure the scholarly quality of the contributions contained herein.
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This study was carried out within the MICS (Made in Italy – Circular and Sustainable) Extended Partnership and received funding from the European Union Next-GenerationEU (PIANO NAZIONALE DI RIPRESA E RESILIENZA (PNRR) – MISSIONE 4 COMPONENTE 2, INVESTIMENTO 1.3 – D.D. 1551.11-10-2022, PE00000004). This manuscript reflects only the authors' views and opinions, neither the European Union nor the European Commission can be considered responsible for them.

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Experimenting with Servitization in the Contract Furniture Sector A Strategic Design Pilot for Sustainable Transition

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Abstract
The Italian contract furniture sector, a key component of the national manufacturing industry, faces urgent needs to align with sustainability goals. Servitization, shifting from product-centric to service-oriented business models, offers promising potential to support this transition. However, its practical application remains insufficiently explored within the furniture industry. Therefore, this research investigates how strategic design can act as a catalyst to support companies' sustainable transition by supporting the development of service-oriented business models and offerings. It further investigates how design interventions stimulate reflection on reshaping existing innovation processes through a sustainability lens. This paper presents empirical design research experiences and results from the ACTAS project, which involved an Italian furniture company in a series of co-creation workshops aimed at prototyping a product service system development process aligned with long-term sustainability objectives. The findings demonstrate that a strategic design approach contributed to aligning visions and strategies across actors and departments regarding sustainable development, and to translating these visions into actionable plans and shared decisions for defining business opportunities. Building on these results, the study proposes a conceptual model that highlights the importance of strategic design interventions across multiple organizational levels and phases of innovation. Overall, the research contributes both methodologically and empirically to the field of design for sustainable transitions by offering practical guidance and a conceptual model to support companies in

Keywords
Strategic Design
Sustainable Transition
Circular Economy
Servitization
Furniture Sector

diid DSI No.3 – 2025
10.30682/diidmics25b

INTRODUCTION

The furniture sector plays a central role in Italy's manufacturing landscape, comprising around 15,000 firms and accounting for 3.3% of the country's total manufacturing output[1]. It stands as one of the country's most export-oriented industries, with nearly €20 billion in 2024, highlighting its strategic importance to the national economy and the "Made in Italy" brand[2]. However, the sector faces significant challenges in aligning with sustainability goals. Despite growing awareness and partial adoption of environmental practices, many companies struggle with the complexities of sustainable and circular development, as well as limited access to knowledge, competencies, skills, tools, and practical examples and experiences for addressing the challenge. Servitization, as a strategic shift from product-based to service-oriented business models, offers a compelling opportunity for enabling sustainable transitions within the manufacturing sector. The advantages of decoupling value creation from material consumption and reducing reliance on the physical performance of products position servitization at the intersection between sustainable development and business innovation (Kjaer et al., 2018). These benefits highlight its potential to support environmental objectives and to drive strategic organizational transformation. However, its implementation requires a well-structured approach that integrates design, planning, and organizational alignment in order to achieve the sustainable development objective. This research investigates how a furniture manufacturing company can be supported in co-defining its pathway toward sustainable transition, one that balances long-term environmental objectives with business development goals. In particular, this study examines the role of strategic design in facilitating this process, positioning servitization as a key enabler for business offering development and organizational and systemic changes.

SERVITIZATION: INTEGRATING BUSINESS INNOVATION AND SUSTAINABLE DEVELOPMENT

Servitization has emerged as a transformative strategy enabling manufacturing firms to shift from product-centric to service-oriented business models, supporting both innovation and sustainable development. The core concept is to develop Product-Service Systems (PSS) that combine tangible products with intangible services to meet customer needs (Besch, 2005; Tukker & Tischner, 2006). The advantage and potential of PSS lie in decoupling economic growth from material consumption, enabling companies to reduce environmental impacts while maintaining or even enhancing competitiveness (Kjaer et al., 2018). PSS enables firms to reconfigure value propositions based on business models such as leasing, sharing, and reselling services. These models enable prolonged product use and reduced material inputs, therefore aligning with circular economy (CE). PSS is recognized as a promising pathway for implementing CE principles in industry (Bocken et al., 2016; Tukker, 2015; Van Der Laan & Aurisicchio, 2019).
PSS can foster the implementation of circular strategies, such as narrowing, slowing, and closing. For instance, Van Der Laan and Aurisicchio (2020)

[1] https://group.intesasanpaolo.com/en/newsroom/all-news/news/2024/furniture-supply-chain-new-markets

[2] https://www.federlegnoarredo.it/it/federazione/presidenza/news-presidenza/in-primo-piano/export-filiera-2024-a-19-4-miliardi-14-4-per-il-macrosistema-arredamento

propose design frameworks that help integrate closing-loop strategies into PSS, facilitating the recovery and repurposing of obsolete resources. These approaches highlighted that systemic collaboration is necessary to foster sustainable development and CE (Sgambaro et al., 2024). The typology of PSS (product-oriented, use-oriented, and result-oriented) also influences the relationship with sustainability and circularity (Tukker, 2004). Use- and result-oriented models, which decouple product ownership from value delivery, are generally more aligned with CE principles. Yang et al. (2018) highlight that these models offer greater opportunities for sustainable supply chain development. Nonetheless, as Pieroni et al. (2018) note, result-oriented PSS remains underexploited in practice, suggesting untapped potential for future innovation.

However, literature also cautions that PSS does not inherently guarantee circular or sustainable outcomes. As Vezzoli et al. (2012) argued, sustainability benefits materialize only when PSS is intentionally designed to achieve environmental and social objectives. Fernandes et al. (2020) pointed to methodological challenges in aligning PSS design with CE strategies. Abdelkafi et al. (2022) show that while servitization reduces the number of products needed in the printing sector, this advantage depends on effective refurbishment and recycling systems coordination.

Therefore, developing PSS offers a strategic lens for manufacturing companies to align business innovation and sustainable development actions that reshape value creation logic by integrating the economically and environmentally sustainable values. However, it is essential and critical that the PSS should be designed, implemented, and integrated within the companies' organizations and across the value creation ecosystem. Systemic integration is crucial to unlocking the full potential of servitization as a lever for sustainability, as it requires a coordinated transformation in design, operations, and stakeholder engagement.

DESIGN FOR SUSTAINABLE TRANSITION: A STRATEGIC AND SYSTEMIC APPROACH

Various contributions within design research present design perspectives on sustainable transition. The Design for Sustainability innovation framework (Ceschin & Gaziulusoy, 2019) illustrated multiple levels of design interventions to address challenges associated with sustainable development. Since the early 2010s, the cluster of design for sustainable transition has emerged as a growing area for design studies and practices. Irwin (2018) introduced the Transition Design framework to tackle 'wicked' problems, such as sustainable development, proposing three phases: Re-Framing the Present and Future, Designing Interventions, and Waiting and Observing. This framework underscores key design attributes, including future visioning, backcasting, leveraging systemic changes through interventions, and adopting systemic mindsets. Gaziulusoy & Erdoğan Öztekin, (2019) emphasized that design for sustainable transition is actively engaged with collaborative problem framing, long-term and alternative scenarios creation, and pathway development for systemic transitions. However, within the business context, framing and incentivizing sustainable transition strategies and actions through a design-led approach is still an emerging area (Falay von Flittner et al., 2022).

In the business sector, design has been recognized as a significant contributor to business and innovation processes (Brown, 2009; Liedtka,

2011), particularly the Fuzzy Front End (FFE) – the exploratory and research stage (Magistretti et al., 2022) of the company's new product development (NPD) process. Design plays a unique role in uncovering unmet consumer needs, reframing innovation problems and opportunities, reducing uncertainty, and facilitating the engagement of key stakeholders (Calabretta & Gemser, 2015; Cai et al., 2023). Design can also interpret weak signals of emerging social and cultural shifts and transform them into opportunities to develop innovative products and services (Verganti, 2009; Pei et al., 2021). The strategic value of design primarily impacts organizations' innovation processes, focusing on enhancing the business and market performance of products and services. However, to address long-term sustainable goals, the innovation and product development processes should evolve to incorporate the criteria of sustainability and systemic changes.

Studies identified barriers for the adoption of sustainable design methods and practices in business oragnizations. Baldassarre et al. (2020) illustrated organizations' challenges in strategically adopting design practices to align sustainable development goals with business operations. The difficulties include the perspective and terminology of sustainable designers, key stakeholders' involvement, commitment, and applying sustainable criteria in business development. Mallalieu et al. (2024) identified methodological, organisational, and human-behavioural barriers to adopt sustainable practices in the manufacturing industry, highlighting the importance of considering an interdisciplinary and systemic perspective to consider the barriers and how design could be a potential enabler for the organisations.

Therefore, in this study, we argue that design for sustainable transition must integrate two essential dimensions emerging from theories of design research and practice. Design inherently operates through the co-evolution of problem and solution spaces (Dorst & Cross, 2001), and it employs situational inquiry to produce contextual knowledge about complex challenges and fosters collective action by facilitating negotiation among diverse actors within a system. First, design should emphasize its strategic value in supporting businesses and organisations to integrate sustainability criteria into their strategies, operations, and cultures. Second, the inherent complexity of sustainable transition calls for a long-term, future-oriented approach, as highlighted in design for transition studies, capable of aligning organizational strategies with broader sustainable goals.

RESEARCH METHODOLOGY

This study adopts a Research-through-Design (RtD) methodology, in which design methods, processes, and artefacts serve as a means for generating knowledge as conceptual frameworks and guiding principles (Stappers, 2007). Based on this research methodology, the practice-based research process is structured into four main phases: (1) hypothesis generation, (2) design and development of the transition process and tools, (3) testing through co-design, and (4) validation **Fig. 1**.

The initial hypothesis suggested that strategic design could support a sustainable transition by developing a product service system that operates across diverse organisational levels, and, in particular, design interventions play a critical role in the early stages of new product development (NPD) processes. This hypothesis was developed by conducting a literature review and sector-specific case studies. Afterwards, the research process is

structured in a visual diagram that represents the transition process, including different phases and actions to illustrate how strategic design interventions act in each phase and how to co-design with the furniture company. This diagram served as both a guiding framework for collaboration with the partner company and a tool to collect feedback through a strategic design pilot carried out with an Italian contract furniture company. The transition process and tools were tested through a series of co-design workshops. All workshop activities were documented to capture emerging insights, reflections, and decisions. The use of co-design methods (Sanders & Stappers, 2008) allowed the active involvement of diverse actors within the furniture company, capturing their perspectives and suggestions on the transition process and tools. It also provided direct information on how the structured process and situated tools could be further adapted to the company's organisational setting and development goals. Moreover, co-design emphasized collaborative knowledge production and shared ownership of design outcomes (Falay von Flittner et al., 2022). The final phase involved synthesizing all collected data, stakeholder feedback, and lessons learned to refine the initial hypothesis and elaborate a conceptual model.

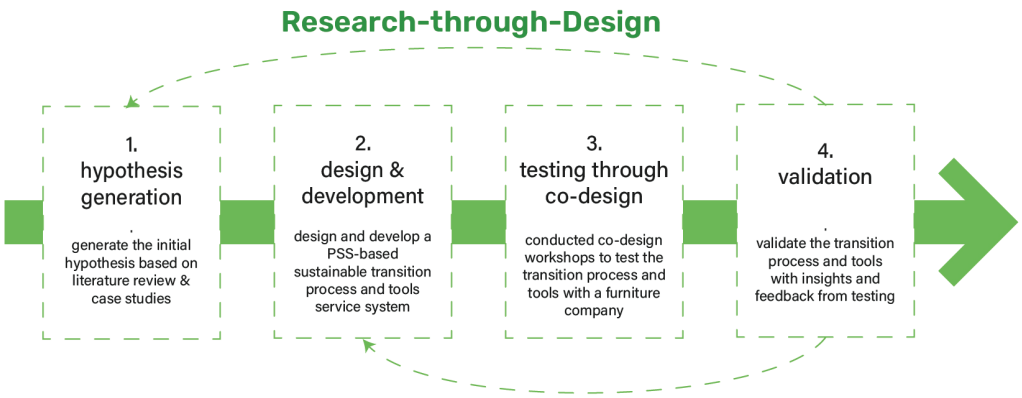

Fig. 1
The adopted research methodology and research process. Elaborated by authors.

STRATEGIC DESIGN PILOT: ACTAS PROJECT

Building on the theoretical background and the objective of activating design-driven sustainable transition actions in collaboration with furniture companies in the contract furniture sector, this paper presents the practical experiences and outcomes of the ACTAS research project, which is one of the projects funded by the MICS PNRR *(Made in Italy Circolare e Sostenibile) under* Spoke 2. All the projects aim to develop and experiment PSS eco-design strategies that support all design phases in fostering sustainability within Italian manufacturing industries.

PROJECT INTRODUCTION

The ACTAS research project stands as a case study that explores the potential of servitization as a driver of systemic change in one of Italy's most emblematic and economically vital industries: furniture manufacturing. As Italy continues to lead the European furniture sector by production value (€17.5 billion according to Eurostat Prodcom), its companies face mounting pressure to reconcile growth with sustainable responsibility. Yet, the sector often

struggles to overcome the operational and cultural barriers to adopting circular economy models. ACTAS addresses this critical gap by proposing design-led innovation to guide furniture companies and their extended supply chains toward service-oriented business models that align with sustainability goals. The project emphasizes a shift from product-centric logic to Product-Service Systems (PSS), where value is delivered not through ownership alone but through experiences, reuse, maintenance, and lifecycle extension strategies. This shift is vital in enabling sustainable transition practices that are both scalable and context sensitive. Focusing on the contract furniture market, specifically the workplace and hospitality sectors, the project provides a controlled yet representative testing ground. Contract furniture's project-based nature, involving multiple stakeholders and demanding high-quality, durable outputs, presents an ideal context for experimentation. The research project's core is the Pilot initiatives in partnership with specific companies, using research through design methods as explained above, with a participatory approach. Indeed, the peculiarity of the pilot developed in this research project is its customized nature and collaborative approach with the company that partnered in the research. Key actions in ACTAS Pilot activities include mapping servitization pathways, designing service-integrated offerings, developing sustainable business models, and initiating organisational transformation processes. These efforts are deeply embedded in co-design practices that engage stakeholders across the supply chain, ensuring that the transition is not only innovative but also inclusive and actionable. By embedding servitization at the core of design strategy, ACTAS positions itself as an initiative in advancing sustainable transition within a traditional manufacturing sector, offering replicable models that can inform broader policy and industry transformations.

PROJECT DESIGN

The ACTAS project employs a participatory and design-driven research methodology, structured as an iterative process comprising three fundamental stages: generating a hypothesis, creating a conceptual model for transition (encompassing PSS and business aspects) for experimentation, and validating the results. This methodological framework shapes a phased research process composed of a preliminary research phase, a collaborative piloting phase, and a conclusive validation and reflection phase. At the heart of the project is a strategic partnership with a leading Italian office furniture manufacturing company, renowned in the field for its expertise in workplace furnishings and sound absorption systems. This company serves as the main testing ground for the project's design interventions and sustainability strategies. The research team comprises four design researchers, working in close collaboration with selected employees from the partner company. Participants are intentionally drawn from diverse business units and roles, ensuring a multi-perspective engagement that spans product development, production, service management, marketing, and strategic planning. This diverse involvement supports a systemic view of the company's operational logic and enables the formulation of realistic and transferable sustainability actions.

The pilot is structured into four progressive steps:

- Step 0 – Assessment and access points mapping: a diagnostic phase focused on assessing the company's current practices regarding the

contract product lifecycle and related materials, product lifecycle, service structures, and business models. This includes identifying entry points for sustainable innovation.

- Step 1 – Transition design workshops: a series of co-design workshops over three months, aiming to guide the company in formulating its transition strategy. The first one focuses on immersing into the company practices and setting the ground for the second, which focuses on reflecting and co-creating possible future opportunities. The last one aims to develop design scenarios that align short-term and long-term strategies.
- Step 2 – Conceptual model development and testing: a phase dedicated to co-developing a Minimum Viable Product and Service System that embodies the proposed sustainable transition strategy. Prototypes and service scenarios are tested within the company's ecosystem.
- Step 3 – Evaluation and strategic roadmap: In this final phase, results from the piloting activities are evaluated collaboratively to identify learnings, refine solutions, and outline a medium- to long-term transition roadmap.

Through this structured but also collaborative approach, ACTAS bridges strategic design with real-world industrial transformation, activating actionable paths for servitization as a key enabler of sustainability in the contract furniture sector. In the scope of this research, steps 0 and 1 with the three Transition design workshops are discussed as a case study. Steps 2 and 3 of the project are under development and refinement.

IMMERSING IN THE COMPANY'S PRACTICE AND SEEDING KNOWLEDGE ON SERVITIZATION TOWARDS SUSTAINABILITY

As part of the ACTAS project's iterative and participatory design methodology, the first stage of the pilot process focuses on immersion and assessment within the partner company. This foundational phase aims to map access points for sustainable innovation through an in-depth understanding of current practices, particularly those related to the contract project's product lifecycle. These early activities are essential to contextualizing the company's operational realities and initiating a shared knowledge base around servitization for sustainability. The research team began with a preliminary diagnostic analysis, reviewing public materials, prior sustainability efforts, and organizational structures. This preparation ensured an informed and targeted fieldwork approach during the subsequent two-day immersion, which included shadowing operations across critical departments (product development, manufacturing process, service management, marketing, and strategic planning). This was not merely a diagnostic phase. Alongside data collection, knowledge was actively disseminated in the first Transition Design Workshop, where the research team introduced core concepts of servitization and sustainable business models through short, informative sessions and facilitated discussions. These moments helped participants connect their day-to-day work with broader sustainability challenges, gradually building a shared vocabulary and opening space for reflective thinking. The participation of employees from diverse backgrounds and business units proved particularly valuable, enriching the dialogue with multiple perspectives and fostering a

collective recognition of both gaps and potential in current practices. This cross-functional engagement also supported internal alignment, making implicit assumptions visible and encouraging internal tuning. This immersive beginning created a robust platform for the following workshops, which will move from understanding the present to envisioning future service-integrated offerings and sustainable transformations.

CO-CREATION AMONG DIFFERENT ROLES IN THE COMPANY TO DEFINE OPPORTUNITIES

The second Transition Design Workshop within the ACTAS pilot marked a key moment in the project's co-creation trajectory. Building on the diagnostic immersion conducted in the previous phase, this session aimed to engage the same company professionals from diverse units in a shared envisioning exercise. At the heart of this workshop was a design-led process of co-creation, understood as the collaborative generation of value by involving multiple stakeholders in the design and decision-making process (Sanders & Stappers, 2008). In this context, co-creation served as a platform for surfacing latent insights, shared meanings, and forward-looking solutions. Structured into two main phases, exploring present and future changes and co-developing possible and preferable scenarios, the workshop guided participants through an open-ended inquiry into emerging challenges and trends within the contract furniture sector. Using a combination of speculative prompts and trend-mapping tools, the teams collectively identified key drivers of change and envisioned how these might reshape the sector. The outcomes took the form of narrative future scenarios, articulated through weak signals, possible system shifts, and early indicators of disruption. This scenario-building approach, aligned with the Futures Cone model and transition design principles (Irwin, 2018), not only expanded the company's strategic horizon but also enabled participants to momentarily suspend their day-to-day roles and collaboratively imagine alternative futures. This ability to "design the future" rather than simply predict it (as echoed by Herbert Simon) is crucial in preparing large organisations for sustainable transition. The diversity of involved roles facilitated the shared perspectives, while the co-design setting, supported by visual tools and neutral facilitation by the research team, helped to overcome internal hierarchies for open and inclusive dialogue **Fig. 2**.
This co-creative engagement is part of ACTAS's broader ambition to gradually activate transformation within the organisational culture, by embedding design-led practices that trigger systemic and strategic shifts. This workshop does not claim to decide and define a complete future scenario and related strategy. Rather, it lays the conceptual groundwork for the third and final co-design sessions.

BUILDING SCENARIOS TO ALIGN SHORT-TERM PROJECTS TO LONG-TERM STRATEGIES

The third and final Transition Design Workshop of the ACTAS pilot was built directly on the co-creative momentum developed in the previous phases. Following the envisioning and speculative scenario generation of the second workshop, the research team undertook a critical synthesis of insights,

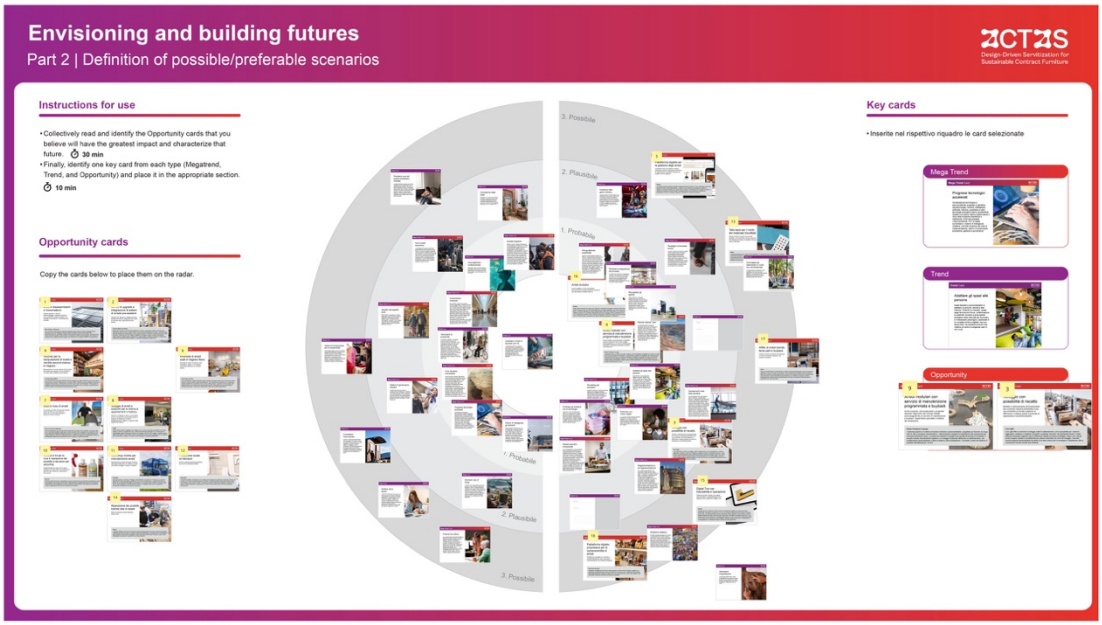

Fig. 2
One example of the results from Transition Design Workshops. Elaborated by the research team with contributions from workshop participants.

connecting the emerging visions of the future with the diagnostic findings and systemic insights gathered in the earlier stages of the pilot. This led to the formulation of several Design Scenarios, each proposing a plausible yet transformative trajectory for the partner company to pursue sustainable innovation through servitization. These scenarios, presented at the outset of the workshop, served as strategic tools to anchor long-term visioning to near-term decision-making. During a collective discussion facilitated by the research team, professionals from various units once again came together to identify which elements of the proposed scenarios held the most relevance and feasibility for initiating a transition in the company's contract furniture offerings and operations. This process fostered a shared understanding of both risks and opportunities embedded in future trajectories. The second part of the workshop employed a backcasting approach, a method that begins with defining a desirable future and then works backwards to identify the steps needed to achieve that future. As Robinson (2003) explains, backcasting is particularly useful "when current trends are part of the problem rather than the solution."

Using specific prompts and visual tools, the team facilitated discussions that encouraged the company to reflect on two main aspects: a) organizational internal implications: how the adoption of specific scenario elements would affect internal processes, product development, manufacturing systems, and customer relationships; b) strategic activation: which concrete starting points could be defined today to initiate a broader, long-term transformation aligned with the preferred future. These reflections and mappings became the groundwork for defining the project's conceptual model for transition. The model will embody a co-developed solution that reflects the company's ambitions and constraints, while serving as a catalyst for sustainable transformation. By aligning visionary thinking with actionable design, this final workshop ensured that the transition journey envisioned through ACTAS does not remain speculative but instead becomes an evolving roadmap of incremental yet strategic change.

A MODEL FOR PRACTISING DESIGN TOWARDS SUSTAINABLE TRANSITION

Thanks to the research activities and generated research results, in this section, we further discuss the research results and propose a model that presents the strategic design approach to support furniture companies' sustainable transition with a focus on developing product service systems **Fig. 3**. The model is conceptualized and informed by the participatory design actions and knowledge generated during the research process, which integrated literature review, case study, interviews, and co-creation workshop practices.

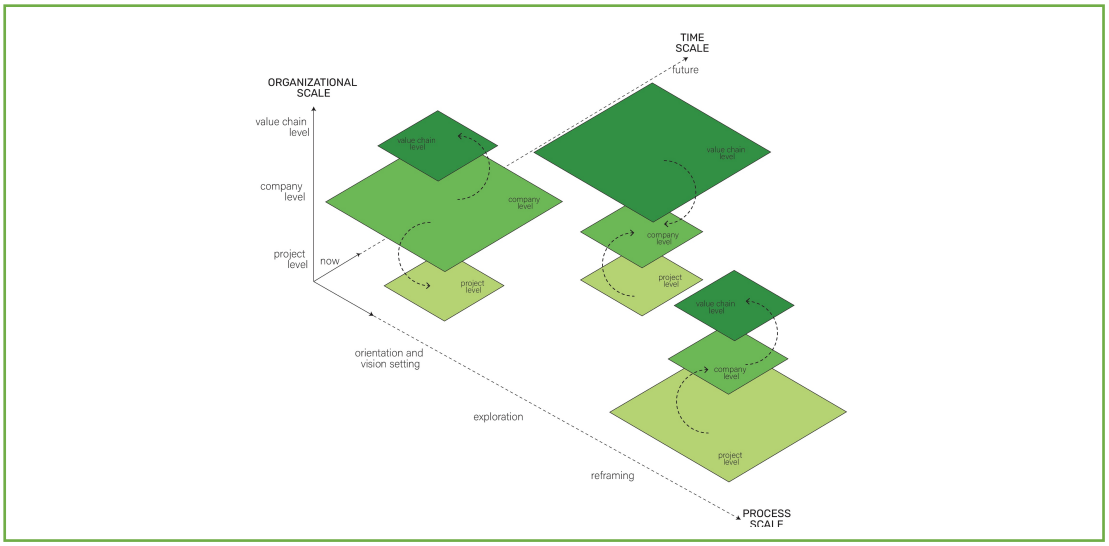

Fig. 3
Conceptual model of strategic design for sustainable transition. Elaborated by authors based on: Baldassarre et al. (2020); Drew et al. (2022); Joore & Brezet (2015); Young (2008).

Our research actions were initiated with the aim of enhancing companies' awareness and understanding of sustainability by offering a comprehensive knowledge base. This was achieved by combining theoretical insights with empirical cases and emerging business solutions from the market. In the initial phase, it became evident that while the furniture industry has begun to integrate design into its sustainable development efforts, the perspective on design's potential remains limited (Pei et al., 2024). Most companies tend to focus narrowly on material choices and ecodesign strategies, such as Design for X approaches (Sassanelli et al., 2020), which primarily address the product level. As previously discussed, the broader strategic value of design, particularly in relation to servitization and sustainable development, remains underexplored, especially from an empirical standpoint (Baldassarre et al., 2019). To address this gap, we presented a holistic vision to support companies in understanding how strategic design can be leveraged to identify and develop sustainable business opportunities. This vision spans multiple levels of intervention across the design process: materials, products, product service systems, and business models (D'Itria et al., 2024). Furthermore, our reserch approach emphasized how design can apply the concept of servitization to fostering business innovation with sustainable criteria. Establishing this shared foundation was a critical step before actively engaging companies in the co-creation activities. Throughout the research process, we employed situated tools and co-creation activities to navigate

across these design layers, adapting them to the specific needs, contexts, and moments.

Experimenting with design for sustainable transition within business organizations entails more than extending design interventions beyond products to include service systems and sustainable business models. Essentially, it requires alignment with the organization's business strategies and decision-making processes. Without the active engagement and endorsement of top-level management, research and design activities risk remaining peripheral and limited to isolated workshop exercises (Rauth et al., 2014). Simultaneously, a lack of deep understanding of the current contract business operations, particularly at the NPD level, hinders the feasibility and integration of new service system proposals into existing business processes. To overcome these challenges, the experimentation process was strategically structured to include co-creation activities aimed at fostering collaboration across organizational levels and along the value chain. These activities were tailored to connect strategic vision, tactical knowledge, ongoing innovation projects, and inter-organizational partnerships. The use of context-specific tools facilitated stakeholder alignment and supported engagement during critical decision-making phases. Managers from R&D, production, and other key departments were actively involved throughout, enabling a more systemic and embedded approach to sustainable innovation.

Throughout the research process, the application of tailored design methods and tools played a critical role in enabling the furniture company to engage with and adopt the proposed design-driven approach. A series of context-specific tools, such as the contract journey map, trend cards, scenario-building canvas, and project brief generation tool, were developed to facilitate active and inclusive participation in co-creation activities, particularly for stakeholders with limited prior experience in design practices. These tools were strategically deployed across various workshops, each targeting different levels of design intervention within the organization. For instance, the tool, contract furniture journey map (a visual map aiming to represent the journey of a contract project and the different roles of the stakeholders involved), was instrumental in fostering a shared understanding among stakeholders involved in the contract business, many of whom typically held siloed knowledge limited to specific segments of the process. In contrast, the scenario-building canvas encouraged participants to look beyond the boundaries of their current operations and envision future-oriented, sustainable business opportunities. By enabling collaborative reflection and systemic insight, these tools supported the development of more cohesive and strategically aligned innovation pathways.

Based on the empirical research results and theoretical knowledge, we propose a model **Fig. 3** that employs a design-driven approach to bridge the different levels from a socio-technical transition perspective to the company's NPD process for developing a sustainable PSS. Its objective is to enable collaborative experimentation in the initial phase of a product design and development process, testing and co-defining strategies for designing sustainable PSS that balance market competitiveness with long-term sustainability goals.

The conceptual model is structured based on three key dimensions. First, it delineates three interconnected organizational scales: *the project level*, representing operational and daily activities related to developing product and service offerings; *the company level*, encompassing tactical and strategic decision-making processes; and the *value-chain level*, which reflects a

systemic perspective that includes external partnerships and broader relationships in the ecosystem. These levels are repeatedly presented in different phases during the innovation process. Second, the model focuses on the early stages of the innovation process, the exploratory and research phases. We have named them as *orientation* and *vision setting*, *exploration*, and *reframing*, following the innovation framework of the British Design Council (2021). The success of innovative actions is rooted in these phases (Verganti, 1997). Third, the model highlights the significance of the temporal dimension in organizational decision-making, coordinating sustainable transition requires across *short-* and *long-term* horizons to adapt within complex and evolving business contexts.

In the *orientation* and *vision setting* stage, the organizational level balanced the systemic and project levels. On the one hand, companies need a comprehensive understanding of the complex system context of the transition towards sustainability, but also consider the current industrial contexts in which the company operates. On the other hand, it is essential for companies to assess their actual practices and projects regarding product development, service structures, and business models. This phase is crucial for identifying the entry points that will activate a sustainable transition process.

The *exploration* stage proposes applying the envisioning activity at the systemic level to identify the current and potential future scenarios of the entire value chain for a sustainable change. These scenarios then should be translated into organisational and project levels, aligning the systemic vision with the company's existing strategy. Balancing this involves considering the macro vision within the company's context while avoiding the company-centric perspective, ensuring the vision remains actionable and aligned with both systemic sustainability goals and the company's strategies.

Simultaneously, the exploration at the company level includes comprehensive research of present phenomena to uncover the root causes of challenges, assess existing businesses and resources for integration or refinement, and identify potential opportunities to develop sustainable projects tailored to the company's context.

The *reframe* stage addresses the (re)framing activities, a typical design thinking practice (Dorst, 2015), to transfer the understanding of a complex problem into actionable business opportunities associated with sustainable criteria. The challenge lies in serving as a catalyst for sustainable directions through framing a design brief that initiates operational design and development activities. The output of this stage reflects systemic implications across product, company, and value chain levels, identifying specific opportunities or challenges. This may involve refining the brief to focus on a particular area or broadening it to address interconnected impacts across multiple levels. Embracing this complexity, even temporarily, is crucial to the process.

DISCUSSION

The project and practical experiences bring contributions and reflections on how strategic design effectively contributes to the sustainable development and transition process in the innovation strategies and business development of furniture companies.

THE IMPORTANCE OF CREATING AND SETTING THE CONDITIONS

Although numerous approaches, methods, and tools have been developed within the domain of design for sustainability (DfS), their translation into industrial practice remains limited. This gap is often attributed to organizational barriers, including resistance to change, lack of design capabilities, misalignment with existing decision-making structures, and short-termism in business priorities (Mallalieu et al., 2024). As demonstrated in this research, the creation of conditions within the organization is essential for activating and adopting design-driven experimentation and innovation (Pei et al., 2024; Wrigley et al., 2020). Our experience with the furniture manufacturing company confirms that fostering internal awareness, trust, and cross-functional alignment is critical to support the adoption of new approaches to product development and sustainable innovation. We scheduled a series of preparatory online meetings and a full-day on-site visit involving the company's core team. These interactions were planned to communicate the project objectives, clarify the design and research process, and explain the expected outcomes in an accessible and context-sensitive language. Furthermore, the effectiveness of this engagement was amplified by a pre-existing relationship of mutual trust between the research team and the company, built through prior collaborations. This lowered organizational resistance, allowing the company to engage openly with new design processes and to explore complex, uncertain themes such as sustainable transition.

MANAGING THE TENSIONS AMONG DIVERSE ORGANIZATIONAL LEVELS

The field of strategic design has increasingly highlighted the value of design as a transformative tool for business innovation, organisational culture, and addressing complex societal challenges (Pei, 2025). When addressing sustainable transition, these dimensions intersect in particularly challenging ways, requiring design to be applied as a strategic approach capable of reframing mindsets and organisational logics. The mindset that perceives sustainability as a constraint to economic performance or innovation can be challenged by strategic design by reframing sustainability as an opportunity for long-term value creation and collaboration (Mosgaard et al., 2025). In our research, servitization was introduced as a means to embed sustainability into business development. By shifting towards service-based business models, such as subscription-based furniture leasing or the resale of second-hand furniture, the company was able to explore sustainable innovation without compromising market competitiveness. However, this shift also involved significant organizational transformation, including the development of new competencies and the establishment of dedicated units responsible for managing service systems and stakeholder relationships. Implementing such changes requires effective coordination across operational, tactical, and strategic levels to ensure coherence and feasibility. Moreover, it demands the integration of sustainability-related competencies, such as those outlined in the GreenComp framework, into the organisation's knowledge base and practices. For this reason, strategic design functions as a "broker" that connects high-level visions and decisions with concrete operational processes (Junginger, 2015). Moreover, sustainable transition must be

grounded in the specific industrial, social, and cultural contexts in which an organization operates. Design research and practices must remain embedded in these realities to ensure relevance and uptake. Our project experience reinforces the need to use strategic design as a contextual and integrative approach to manage complex transitions that address environmental, economic, and socio-cultural dimensions simultaneously.

ALIGNING LONG-TERM SUSTAINABLE GOALS AND SHORT-TERM BUSINESS ACTIONS

The strategic role of design for sustainability transitions also lies in its capacity to support organizations in envisioning future-oriented scenarios that inform short-term decisions while aligning with long-term sustainable objectives. By integrating design practices into strategic foresight, companies can explore emerging trends, anticipate disruptions, and reframe challenges as opportunities for business innovation (Schwarz et al., 2023). This forward-looking perspective enables decision-makers to embed sustainability considerations into early-stage projects and everyday actions. Design approaches such as speculative design and design futuring (Dunne, 2013; Fry, 2009) challenge conventional assumptions and promote dialogue on technological, societal, and ethical implications beyond the company's current business context. In our research project, a scenario-building workshop served as a strategic activity to guide the company in identifying future directions for sustainable development. This exercise raised a range of business opportunities that had not been previously considered by the furniture company. The created scenarios were aligned with broader sustainability and competitiveness trends in the furniture sector and helped generate ideas for potential projects distinct from the company's existing offerings. When conducted through a strategic design lens, foresight and visioning not only enhance innovation capabilities but also foster dynamic organizational capacities such as sensemaking and learning (Elsbach & Stigliani, 2018), which are essential for navigating sustainability transitions as a drive for generating value.

CONCLUSION

The research project demonstrates that design's strategic contribution emerges in creating the conditions that allow organizations to engage with complex challenges in an open, future-oriented, and experimentation-driven manner. The work carried out with the furniture company demonstrates that establishing internal awareness, cultivating trust, and fostering cross-functional alignment are crucial steps for activating and integrating sustainability into everyday decision-making.

From a theoretical perspective, the study contributes to the ongoing debate on the role of design in sustainability transitions by outlining how strategic design can link vision, organizational learning, and operational changes. The results show that design is effective in reframing sustainability not as a constraint, but as a strategic opportunity for long-term value creation and exploring alternative business logics, such as servitization. Moreover, the integration of design-based foresight and scenario building illustrates how design can reinforce dynamic organizational capacities, such as sensemaking, anticipation, and learning, that are crucial for navigating uncertain transition

pathways. Sustainable transition, especially when it involves shifting from product-centric to service-oriented models, requires time, repetition, and continuous intervention. Organisational mindsets, routines, and logics do not transform through isolated actions; they evolve gradually through cycles of reflection, experimentation, and consolidation. This study confirms that cultivating a culture of transition demands iterative processes that extend beyond the temporal boundaries of individual projects and that progressively shape the organisational maturity necessary for systemic change. For this reason, companies aiming to embed sustainability into their innovation and business development processes should prioritize sustained design engagement, supported by structures that facilitate cross-departmental collaboration and learning.

The findings also highlight several limitations. First, the project-based nature of this intervention necessarily restricts its scope. While the collaboration enabled an in-depth exploration of design practices and generated significant insights for the company, scaling the approach to a larger or more complex organization would require multiple, coordinated interventions distributed across different units and decision-making levels. A single initiative, even if well-structured, cannot fully activate the systemic cultural and organisational shifts needed for long-term sustainable transition.

Second, the size and cultural characteristics of organisations strongly influence both the process and its outcomes. Large companies, such as the partner involved in this research, may possess the financial resources, tools, and organisational structures needed to invest in a sustainable transition; yet, their transformation processes are often slowed by internal complexity, diverse agendas, and business routines, as well as the need for endorsement from decision-makers. Conversely, smaller organisations in manufacturing industries may benefit from greater agility and more direct interpersonal dynamics, but they often lack the risk tolerance, capabilities, and financial commitment required to invest in transformative and service-oriented practices. This creates a paradox in which neither large nor small organisations are inherently more predisposed to embracing transition, but each face distinct structural and cultural barrier.

These contextual differences limit the generalisability of the findings and reinforce the crucial need for design interventions that account for organisational diversity and industrial specificity. In practice, strategic design must be able to recognise these constraints and adapt their modes of engagement to support transition processes that unfold at different scales, rhythms, and levels of organisational maturity.

Future research should therefore explore the application of this strategic design approach across multiple companies of different sizes and cultural profiles, ideally through longitudinal studies that can observe how design capabilities evolve over time and how iterative interventions can consolidate cultural change. Expanding the research to other segments of the manufacturing sector could further validate the relevance of the proposed approach and identify additional opportunities for design-led sustainable transition. Nevertheless, this study reinforces the role of strategic design as a contextual, integrative, and future-oriented approach that supports organisations in navigating the complexity of sustainable transition. By enabling new forms of collaboration, fostering learning, and creating the conditions for iterative cultural transformation, design can help companies move toward more resilient, service-oriented, and sustainable business models.

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Acknolwedgments

The paper is the result of joint research. The methodology and research results are produced by all the members of the ACTAS project team at the Design Department of Politecnico di Milano.

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Published in January 2026 by Bologna University Press

DIGITAL SPECIAL ISSUE 3

This special issue of DIID brings together the broadest possible reflection on projects that, with a low Technology Readiness Level (TRL), have attempted to translate years of ongoing research within the sector towards unexplored directions, towards renewal processes framed by sustainability and circularity. All of this is pursued with the aim of enhancing the sustainable competitiveness of Made in Italy through concrete actions developed in collaboration with companies involved from the very beginning, as well as with other firms interested in the relevant themes.
The projects were developed within the following universities: Politecnico di Bari, Politecnico di Milano, Politecnico di Torino, Università degli Studi di Napoli Federico II, Università degli Studi di Palermo, Università di Bologna, Università di Firenze e Sapi-enza Università di Roma.
The overall picture that emerges from this overview of research activities is rich in in-sights and demonstrates how our scientific sector, when compared with fields that have a longer historical tradition in research, is nevertheless capable of making a significant contribution. It also shows that scientific research in the field of Design is able to generate incisive and relevant reflections and solutions for the driving sectors of Made in Italy.

Michele Zannoni
Giuseppe Lotti

DSI No. 3 — 2026
Year XXIII
ISSN 1594-8528
ISSN Online 2785-2245

Bologna University Press