# Designing the Transition

SEVEN DESIGN PERSPECTIVES TO BUILD CAPACITIES FOR PEOPLE, ORGANISATIONS AND ECOSYSTEMS

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The chapter presents the rationale behind the conception of the ECODeCK project in relation to the challenges posed by the sustainable transition of the manufacturing sector. The project ECODeCK is rooted in the assumption that design practice and design research can play a crucial role in fostering sustainable transition, a word often used as a marketing claim rather than a primary value to inform production strategies. More specifically, ECODeCK is grounded in the idea that design can be a powerful cognitive tool to connect people, organisations and ecosystems. The chapter introduces a design-led approach of building capacity for sustainable transition that engage three different levels: (I) on human and people level by fostering their sustainability competences development, (II) on organization level by informing new strategies to cope with sustainable transformation, (III) on ecosystem level by contributing to support the development of effective entrepreneurial ecosystem and policies. ECODeCK proposes to leverage the interconnection of these levels to foster a paradigmatic change about sustainable transition through project-based learning training. The solution-oriented and pragmatic approach char-

acterizing designerly ways of thinking becomes the enabling factor for trainees to face sustainability challenges, envision new production ecosystems and inform collective actions within and beyond their organisations.

## 1.1 Introduction: Systemic Changes Towards Sustainability in the Italian Manufacturing Sector

Like other national systems in the Global North, the Italian manufacturing sector has consolidated the *Made in* label as a mark of value, particularly through its emblematic fashion and furniture industries. Historically rooted in artisanal excellence and global export leadership, these sectors now find themselves at a critical crossroads, facing mounting environmental, social, and regulatory pressures that demand profound transformation (D'Ascenzo *et al*., 2025). In this context, proposing ECODeCK within the fashion and furniture domains of Made in Italy is both strategically relevant and symbolically resonant. The Italian fashion industry – globally influential and economically significant – is increasingly scrutinized for its environmental footprint. According to the United Nations Environment Programme, it contributes up to 10% of global carbon emissions and 20% of global wastewater (UNEP, 2019). Italy occupies a leading role in global fashion production, representing the country's second-largest industry by productivity, export volume, and total turnover. The sector comprises approximately 60,000 enterprises and employs around 600,000 individuals (Camera Nazionale della Moda Italiana, 2025). By contrast, the Italian furniture sector, renowned for its regional craftsmanship and heritage brands – particularly in areas such as Brianza and Veneto – confronts a different type of challenge: cultural inertia and resistance to change. With more than 21,000 manufacturing companies and a total turnover nearing €27 billion in 2022 (FederlegnoArredo, 2016), the sector epitomizes Italy's artisanal pride. However, sustainability-oriented transformation is often perceived as a threat to the authenticity and identity of traditional production practices. Despite its strong

export performance and aesthetic leadership, the sector's innovation efforts frequently remain confined to incremental adjustments or superficial *greenwashing* (Julier, 2013). Nonetheless, evolving European Union regulations, such as the Ecodesign for Sustainable Products Regulation (ESPR), alongside rising consumer demand for transparency and circularity, are compelling even the most traditional actors to reconsider their practices. The imperative for a sustainable transition in manufacturing has intensified, as businesses are increasingly required to adopt development models that move beyond linear, resource-intensive systems. Sustainability is no longer merely a matter of compliance, but has emerged as a strategic imperative and a source of competitive advantage. However, this transition is complex. Conventional design practices – often centered on aesthetics and product-level innovation – have limited capacity to address the systemic and multidimensional challenges posed by sustainability. To be effective, design must evolve to encompass broader systemic concerns such as circular economy integration, stakeholder collaboration, and long-term value creation. While some Italian manufacturers have adopted promising practices, many continue to operate within early-stage, compliance-oriented models, focused more on adhering to standards than on rethinking production and consumption paradigms (D'Itria *et al*., 2024; Davelaar, 2021; Gaziulusoy & Erdoğan, 2019). This situation underscores a cross-sectoral need for new tools and frameworks capable of fostering transformative change. The ECODeCK project responds to this need by reinterpreting design as a lever for systemic innovation, promoting a shift from isolated initiatives to integrated, multi-level capacity-building. It offers a compelling opportunity to support sustainable innovation not merely as a regulatory obligation, but as a transformative force. ECODeCK's systemic design approach is particularly well-suited to both sectors. In fashion, it facilitates urgent environmental adaptation through collaborative, regenerative strategies. In furniture, it provides a cultural reframing, positioning sustainability not as a rupture with tradition, but as its natural evolution. By engaging stakeholders in processes of shared inquiry and systemic learning, ECODeCK offers a platform that reconciles sustainability with the enduring values of Made in Italy – aligning cultural heritage with forward-looking innovation.

## 1.2 The Rationale Behind ECODeCK Project

The ECODeCK project was conceived in response to the urgent need for sustainable transformation within Italy's manufacturing sectors, particularly fashion and furniture, two pillar sectors of the *Made in Italy* identity, deeply embedded in local craftsmanship, design culture, and global markets (Fornasiero & Tolio, 2024; Coltorti, 2013). Recognising the limitations of conventional design approaches rooted in object-making and product aesthetics, ECODeCK embrace design as a systemic process capable of enabling organisational transformation, stakeholder collaboration, and innovation ecosystems. Indeed, design has evolved from a discipline focused on the creation of physical artefacts and visual communication into a strategic practice addressing complex systems, human interactions, and cultural transformation. Richard Buchanan in 1992 mapped this shift with his *Four Orders of Design*, which expanded the scope of design from symbols and things to actions and systemic environments (Buchanan, 1992). This reconceptualisation moved design from being artefact-centred to engaging with social practices, institutions, and broader societal challenges. As Manzini in 2015 stated, the designer's role becomes a facilitator of social innovation, focusing on collaborative processes that empower communities to co-create solutions (Manzini, 2015). Other scholars further critique fixed, linear models of design, instead framing it as a dynamic and situated practice shaped by institutions, cultures, and evolving societal needs (Kimbell, 2011). This evolution of design practice is deeply intertwined with the increasing complexity of the sustainable transition. As sustainability challenges (climate change, social equity, ecological resilience) require systemic, participatory, and adaptive responses, design provides a framework not just for problem-solving, but for reframing and reshaping the relationships between people, technologies, and ecosystems (Chick, 2012). The discipline's shift reflects its growing relevance in orchestrating the transition toward more sustainable, inclusive practices and actions. The ECODeCK project embraces this shift in perspective: from design as a solution to individual problems, toward design as a cognitive and strategic tool for navigating complexity and activating long-term change. ECODeCK bridges knowledge, skills, and transformation by

integrating research-driven frameworks, applied methodologies, and training interventions to support professionals and organizations in developing the competencies needed to adapt, innovate, and thrive in the face of sustainability challenges. Through this lens, the design process can be framed as a vehicle for capacity building, aligning innovation with ecological regeneration, and socio-economic resilience. The *designerly way* (Cross, 1982) offers a distinctive epistemology that complements scientific and engineering approaches by emphasizing problem framing, creativity, and iterative prototyping as means to address complex challenges. In the context of sustainability, this approach enables the development of simple yet effective tools and methods that help designers navigate and communicate systemic complexity (Cross, 2001; Buchanan, 1992). Unlike conventional training programs that often prioritize linear problem-solving or static knowledge transfer, the hands-on and iterative nature of design fosters future-oriented thinking by envisioning alternative scenarios and creating novel value propositions (Liedtka, 2015). Creativity, a core element of design practice, plays a transformative role in shaping shared and desirable futures aligned with sustainability transitions (Mulgan, 2018). Design researchers and practitioners introduce diverse perspectives that differ from traditional disciplinary roles, thereby fostering more holistic and systemic approaches to planning and implementing sustainable innovation (Manzini & Rizzo, 2011). This orientation helps reduce uncertainty and perceived risk, supporting the co-creation of context-sensitive, innovative pathways for change (Calvo & Sclater, 2021). Moreover, design's inherent focus on visualization and communication enhances the ability to surface and interpret the layered complexities associated with sustainability transitions, particularly in industrial contexts (Sevaldson, 2011). Design practices such as storytelling, scenario building, and visual prototyping engage stakeholders emotionally and cognitively, creating shared understanding and fostering commitment to collective action. These attributes make design a powerful enabler of bridging knowledge and skills for fostering organizational and systemic transformation towards sustainability.

## 1.3 Design for Sustainable Transition Through Capacity-Building

Design-based education and capacity-building are increasingly recognised as pivotal for driving sustainability transitions, moving beyond conventional approaches to foster deep, systemic change. This perspective acknowledges that academia is embedded within broader socio-ecological systems and is responsible for actively contributing to transformation. The inherent nature of design, as both a field of knowledge and research, is uniquely positioned to innovate instructional practices and cultivate sustainability competencies through hands-on learning. A core strategy for this educational shift is the adoption of Project-Based Learning (PBL), often encapsulated within Design-Based Learning (DBL). DBL is a well-established pedagogical approach in design education where learners construct knowledge, skills, and abilities by self-directing the process of creating solutions to real, open-ended, and ill-defined design problems within a situated context that aims to recreate real-world interactions (Mattioli, 2022). This approach naturally promotes a constructivist, self-regulated, situated, and collaborative learning paradigm (De Corte, 2010; Mattioli, 2022), emphasising that knowledge is built through direct experience and mindful interactions with others and the environment. The experiential and authentic nature of DBL environments makes it particularly effective for fostering holistic competence development, aligning seamlessly with the demands of sustainability education. Crucially, this pedagogical framework enables embracing uncertainty through designerly ways of thinking. Design intrinsically provides an orientation toward *wicked problems* – complex issues with no single solution – and offers the proficiency to manage uncertain and intricate situations characteristic of sustainability challenges. The iterative process inherent in design, involving testing, experimentation, feedback, and refinement, directly mirrors the uncertain and evolving nature of sustainability outcomes. Learners in design-based learning are encouraged to be flexible and adaptable, continuously acquiring new knowledge and skills as they iteratively refine their problem perceptions and solutions. The value of experiential, problem-based training approaches

is underscored by constructivist learning theories, which assert that competence develops through direct experience and active engagement. In design-based learning, this translates to a *learning-by-doing* principle, where learners acquire design competence through hands-on experience with the design process. This active engagement acts as a learner-motivated activity, leading to integrated outcomes and sustained participation, fostering self-regulated learning as students acquire knowledge and skills to address the initial design problem. Educators facilitate this by posing problems that trigger inquiry, reasoning, and the creation of innovative solutions. Furthermore, sustainability education benefits immensely from participatory and non-linear learning. A socio-constructivist view, central to effective ESD, rejects the notion of passive learners, instead positioning them as active agents who co-construct knowledge through meaningful participation and shared experiences. Design-based learning, with its emphasis on collaboration, provides a relevant interactional and contextual opportunity for students to develop intercultural and social competences. This collaborative learning fosters a deeper understanding of diverse perspectives and enables collective problem-solving, which is essential for defining solutions to complex sustainability problems. The non-linear nature of these processes reflects the reality that knowledge creation and application are not sequential but rather involve continuous interaction and re-evaluation. This dynamic approach encourages diversity, heterogeneity, and the formation of creative knowledge environments. Effective design-based education for sustainability transitions should target three-impact levels of a systemic transition: individuals, organizations, and ecosystems. At the individual level, the goal is to cultivate sustainability competence. Competence is the capacity to mobilise relevant knowledge, skills, and attitudes, understood within a given value framework, to respond appropriately and effectively to sustainability challenges. Sustainability competences are those competencies needed to confront sustainability issues. Capacity building primarily aims to stimulate participants' competence acquisition to inform their actions. From this conception, capacity building can become a key for employee training to develop sustainability competences. Thus, this capacity can leverage employee growth, engagement and empowerment. Design-based capacity building can become the means to con-

nect sustainability values to actions, concretely bridging abstraction to concreteness. Also the learning-by-doing approach intrinsic to DBL, if consciously designed according to a sound understanding of the guiding competence framework, can become a key to holistically consider all the competences needed to guide increasingly sustainable actions. For organizations, design-based capacity building aims to enable strategic sustainability shifts by fostering the competencies needed for socio-ecological transformation within their human capital. Projects like ECODeCK focus on building capacity for cross-departmental employee groups within manufacturing companies, promoting a broader understanding of organizational practices, opportunities, and constraints for sustainable action. Design capabilities can enhance individual creative confidence and engagement when embedded in human resources practices, driving organisational cultural change. This approach equips firms to integrate diverse knowledge sources, navigate technological complexity, and foster cross-organizational collaboration for sustainability-oriented new product development. At the broadest level, design-based education contributes to systemic innovation and policy development, as conceptualized by the Quintuple Helix innovation model. This model highlights that the natural environment acts as a crucial driver for knowledge production and innovation, creating incentives for sustainable development across society. Investments in the education system (human capital) lead to new knowledge being fed into the economic system, stimulating the growth of a *green economy*, creating new jobs, and sustainable economic growth. This, in turn, influences the natural environment by promoting protection and regeneration. The continuous circulation of knowledge through various societal subsystems, including media and political systems, supports establishing a *knowledge-based democracy* and promotes informed political citizenship.

## 1.4 Conclusion: Towards a Design-based Culture of Sustainability

ECODeCK envisions a future where design operates not as an auxiliary function, but as a central driver of collective action towards sus-

tainability. Thus, design transcends its traditional role of knowledge transfer to become an enabler of transformation, fostering critical thinking, participatory processes, and context-sensitive innovation. Rather than delivering static solutions, design becomes a dynamic method for sensemaking, empowering individuals and organizations to reframe complex challenges and co-create systemic responses. By emphasizing design's relational and ecosystemic dimensions, ECO-DeCK promotes a cultural shift that embeds sustainability into the core of industrial practice, education, and policy-making. Sustainable transition represents a multifaceted and long-term endeavor. Within this context, the proposal of a design-based capacity-building project emerges as a promising pathway to bridge the current gap between design research and sustainable development practices. The ECO-DeCK project exemplifies how design can serve not merely as a problem-solving tool, but as a strategic and transformative approach that enables industrial sectors to build the necessary capabilities to generate sustainable solutions over time. Rather than prioritising rapid solutions and outcomes, this perspective emphasizes the importance of long-term capacity building and the features of a design-based approach to doing so. The design-based approach fosters the development of flexible, context-sensitive, and resilient solutions that can respond to the evolving challenges of sustainability. Shifting the focus from traditional education and training toward capacity-building reflects a more systemic and empowering approach that equips individuals, organizations, and communities with the competencies needed to actively shape their sustainable futures. However, implementing design-based capacity-building within industrial contexts involves several challenges. Integrating design methods into existing production systems and aligning them with regulatory and institutional frameworks requires careful deliberation and collaborative effort. A key barrier lies in the need to articulate and demonstrate the tangible benefits of design interventions in ways that resonate with business and policy stakeholders. Furthermore, while design practice often operates within short- to medium-term project cycles, sustainability transitions demand a strategic orientation toward long-term goals and intergenerational impacts. Therefore, in this book, the ECODeCK project has involved diverse perspectives and areas of design in

promoting a design-based culture of sustainability through capacity building. An essential objective of the ECODeCK project is the educational mission of academia. Within a broader vision of education for sustainable transition, universities and research institutions must evolve from knowledge providers to active agents of transferring the knowledge to activate and foster the transformation. The responsibility of academics, particularly in the design field, is to craft learning environments that extend beyond the classroom, engage real-world contexts, and create instructional design as a form of design to support the learning process. The pedagogical structure of the ECODeCK training model ensures that the capacity-building actions are grounded in real contexts and adaptable to the diverse learning needs in complex industrial systems. At the core of the project lies a strategic and systemic vision of design, particularly a strategic design approach. Sustainable development requires moving beyond firm-centric innovation and toward value co-creation across extended ecosystems. By emphasizing the importance of collaboration between firms, institutions, and actors, the ECODeCK project included the strategic design approaches and methods to position design as a driver to build collaborative strategies and capacities across the value chain. ECODeCK project promotes the necessity of developing ecosystem-level strategies, where design supports cross-boundary learning, stakeholder engagement, and shared responsibility. To leverage the collaboration among diverse actors, it is essential to emphasize the unique role of participatory design within the ECODeCK project. Participation is not a methodological option but a foundational principle that enables transformation to be inclusive, situated, and meaningful. Co-design practices and dialogic learning within the ECODeCK project ensure that design interventions are co-produced and rooted in the lived experiences, cultural contexts, and collective intelligence of diverse stakeholders. Introduction of the concept of regenerative creativity offers a complementary perspective, a forward-looking redefinition of creativity that shifts from problem-solving to systemic regeneration. This design approach advocates a paradigm of change that restores ecological and social systems while transforming human values. Creativity, in this sense, becomes a distributed and collaborative process, not confined to innovation

labs or artistic expression, but embedded in how organizations and individuals envision futures and act upon them. Transforming practices also requires internal cultural change, in which the role of design could play in reshaping organizational culture towards sustainability. The concept of *design culture* explains how design interventions can gradually realign an organisation's culture with sustainability principles by operating across individual, team, and organizational levels. This design approach guarantees that ECODeCK fosters transformation not as a top-down mandate but as a participatory and engaging process. The sector-specific lens and knowledge are necessary to bring systemic changes to tangible practices through design. The contradictions between traditional mass production and sustainability imperatives in the fashion and furniture sectors advocate for a shift toward circularity, social equity, and responsible innovation. Design serves as both a practical and symbolic tool for enabling new production systems while also reshaping the narratives and cultural meanings that sustain overconsumption. Particularly, the fashion sector could act as a laboratory for testing how design-driven education and systemic thinking can challenge entrenched industrial norms. This enables the ECODeCK project to translate conceptual transformation into the development of concrete design actions and strategies capable of reorienting practices within manufacturing sectors. The ECODeCK project embraces a design-driven approach that is both pragmatic and future-oriented. By leveraging the strategic role of design, it fosters cross-disciplinary collaboration, engages stakeholders, and supports transformative processes across the manufacturing ecosystem. Through the integration of design into capacity-building initiatives, ECODeCK nurtures a sustainability-oriented mindset, equipping organizations to navigate complexity, respond to emerging challenges, and generate long-term value. In doing so, it contributes to building more resilient, inclusive, and sustainable models of production. The following chapter delves into the theoretical foundations that inform this approach, presenting the key results and conceptual frameworks that shape the ECODeCK capacity building model.

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