

Strategic Design in Industry and Business

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Abstract This chapter examines the role of strategic design within industry and business, emphasising its transformative impact on economic, technological, and human dimensions. It traces the evolution of strategy and design through industrialisation to the modern day, where design addresses complex organisational challenges. The chapter highlights crucial concepts such as design thinking, the integration of design and management, and the pivotal role of technological innovation. It discusses strategic design's contributions to fostering innovation, sustainability, and competitive advantage in organisational design. Through case studies, the chapter illustrates strategic design's practical applications, referencing Galbraith's Star Model™ as a framework for implementing strategies within organisations. These case studies showcase strategic design as an essential tool for navigating contemporary challenges, advocating a holistic, user-centred approach that merges creativity, strategy, technology, and human considerations in organisational systems. The cases range from digital transformation in a high-tech firm and developing employee-centric green pension funds, to coaching employees for upcoming transformations, and testing sustainable living solutions with advanced monitoring, emphasising strategic goals, user involvement, and systems thinking.

3.1 Strategic Design from the Perspective of Time

Technological advancements drive organisational change and value creation, necessitating a balance between technical and social aspects for sustainable value and improved work quality. Socio-technical systems (STS) thinking, pioneered by Tavistock in the 1960s, emphasises aligning technical capabilities with social needs (Trist et al. 1993). Initially, technology was seen as the primary variable until digitisation shifted this perspective, highlighting the interplay between humans and machines. Govers and Amelsvoort (2023) advocate for integrating digital technologies into design processes through STS design (STS-D) to address evolving business needs and stakeholder involvement. Tortorella et al. (2024) highlight the role of Industry 4.0 (I4.0) as an STS in fostering innovation, emphasising the integration of knowledge and innovation management practices and I4.0 design principles. These viewpoints emphasise the critical role of design as a strategic element in front of technological development. Strategic design, particularly through design thinking, in driving transformation to improve organisational adaptability and gain a sustainable competitive advantage.

To begin with, the term strategy is grounded in management originating from politics, warfare (Clausewitz) and later on used in the context of managerial context (Daniels and Schmitz 2006). Strategy plays a central role in the planning and execution of both long and short-term, connecting it with design principles—it becomes a game changer (Meroni and Sangiorgi 2011; Cummings and Daellenbach 2009; Schuh et al. 2011). If one were to discuss strategy in the early stages of nineteenth-century industrialisation, it would typically refer to companies attempting to position themselves in the flourishing global market (Clarkson 1985) and the significance of design was still influenced by handicrafts and manufactories. The past two centuries have seen remarkable technological progress, fundamentally changing how we live. This period is not just marked by fast technological growth but also by the rise of strategic design, vital for utilising these advancements to meet business goals and enhance human interactions.

At the beginning of the twentieth century, strategy first began to emerge through the implementation of strategic measures in product development. Within the context of efficiency and mass production, products were optimised for manufacturing processes, with the assembly line production of the first Ford model T serving as a prime example, making the product accessible to the mass market as a result. The role of designers has undergone significant transformations throughout and along these phases of industrial change (Sparke 2019). During the turn of the century, Peter Behrens, serving as a “design manager” at AEG, oversaw comprehensive design from product to corporate architecture (Frank and Lelonek 2015). This expanded the designer’s role to encompass more strategic components alongside traditional design tasks. From the beginnings in the founding period and interwar avant-garde to the modern era, where diverse design movements first brought the term “design” as related to a profession in industry into discourse. Throughout the twentieth century, there was a growing emphasis on integrating new technologies and the emergence

of early computers and the Information Age presented both challenges and opportunities for design. In the 60s and 70s, companies such as BRAUN, influenced by the design stance “functionalism”, and later, during the era of semantics and interaction in the 90s and 2000s, Apple demonstrated that design became a central element in the value chain and the offer (Hobday et al. 2011). The digital revolution in the 2000s marked a pivotal shift in the utilisation of technology in business value creation, with strategic design becoming an integral part of the success of these new technologies. This shift emphasised user experience, market adaptation, and the potential for future innovation. The personal computer, internet, and mobile communications required a deep understanding of user needs and strategic planning to ensure widespread adoption and utility. Businesses realised the importance of design strategies for adaptable and efficient technologies, leading to innovations like modular computing systems.

The twenty-first century has witnessed swift technological progress in fields such as artificial intelligence, blockchain, renewable energy, and biotechnology. Strategic design during this period emphasises foresight, sustainability, and the creation of integrated systems to tackle intricate global issues. There is a newfound emphasis on crafting solutions that are not just technologically groundbreaking but also sustainable and ethically accountable, showcasing a deeper recognition of design’s strategic contribution to organisational advancement. With contemporary turbo-industrialisation and the technological interconnectedness, we now witness another surge in the impact of designers in complex economic and societal contexts. Today, design is seen as a problem solver and strategist, moving away from the craftsmanship of designing objects towards the craftsmanship of understanding and designing complex interactions and organisational processes embedded in related close and distant systems. And this is no different from the fundamental understanding of strategic action in the management of organisations. Strategic design drives successful technology adoption by focusing on long-term vision, user-centred approaches, and technology integration. It aligns technological advancements with strategic objectives, ensuring global relevance, usability, and impact.

Economists Kondratieff (1926) and Schumpeter (1939) emphasised the correlation between economic and technological development in their long-term studies. Maintaining Schumpeter’s fundamental assumptions about innovations driven by credit creation as the force behind capitalist dynamics, Carlota Perez presents an alternative model of the process of diffusion of technological revolutions based on these principles (Perez 2002). Her model refers to a historically recurring sequence of phases in which the diffusion of each technological revolution takes place. This sequence extends from the visibly unfolding phase after a prolonged period of development, through integration into the economic and social system, to the exhaustion of innovation potential in maturity. As these changes influence social systems, there is an increasing emphasis on incorporating human considerations into the development of any product or service. From this perspective, the design profession evolved alongside technological and market changes (Bonsiepe 2009). The increasing complexity of design activities becomes even clearer considering dematerialisation, as products shift towards interaction through a dominance of digital functions and services

(Thackara 2006). The field of service design marked a pivotal turning point, emphasising that designers now shape systems, processes, and experiences. Strategic design is a subsequent step, indicating that complexity and interconnectedness is demanding designerly support, as Buchanan (1992, 2015), Buchanan and Margolin (1995) previously termed “The four orders of design”. He demonstrates the evolution of the design profession which has developed its reach from visual, to industrial and interaction towards the design of systems, environments, and organisations (Buchanan 1992, 2015; Buchanan and Margolin 1995). From this perspective, the design practice seems to represent an ability to understand challenges through a reflective and universal approach.

Architects such as Knud Lönberg-Holm (Strum 2019) and Richard Buckminster Fuller were already searching for a universal formula of form or *gestalt* in the 1920s and 1930s. Informed by the principles of “dymaxion” and “tensegrity”, it was already clear to them at the time that the development of form is an expression of interrelated, repetitive patterns and dynamic transformation (Krausse and Lichtenstein 2001). Futurologist Naisbitt (1982) started to undertake long-term studies from statistical data throughout the USA. Based on his work, Naisbitt already had a quite clear idea of what the future would bring and saw various changes in society such as the shift from *industrial to information society*, from *representative to participatory democracy* or from *hierarchies to networks* already in the 1980s (Naisbitt 1984). Even if all these shifts do not take place at the same time and place within the same dynamics. Today, we realise that we are living within complex networks in private and professional life. Other futurologists took it even further and built up on Naisbitt’s works defining more distinct directions and themes such as the shift of *individualisation, the gender shift, silver society, knowledge culture, new work, health, neo-ecology, connectivity, globalisation, urbanisation, mobility, security* (Horx 2011). He understands digitalisation as part of the major shift of connectivity—above all as a larger principle that changes the spirit of mentality, markets, economic cycles, technology and ultimately as part of a complex shift that is beginning to be difficult to sense in its dimensions (Horx 2011). And yes, technology is part of this complexity but is not the focus of attention from this perspective (Fig. 3.1). If we focus on technology trends, then it might be relevant today and promises success. If we aim to transform behaviour and organisations, we need to open the perspective much further.

Looking at the current development of the design discipline, born initially from product-oriented craftsmanship, it has undergone a paradigm shift within the context of industrial development over the last 100 years itself. Strategic design is an acknowledgement of the growing complexity in which designers operate on various levels and address societal issues. From the perspective of paradigm shifts, niche developments are an interesting phenomenon as they emerge during mainstreams as opposing trends and may or may not develop further. Their growth potential depends on their connection to other dynamics in society and industry. Ultimately, long-term changes are more profound than short-lived phenomena. While these short-term movements may become stronger, exhibit a pattern, increase in magnitude, and ultimately become intertwined in larger systems, they either grow with or themselves become a force for

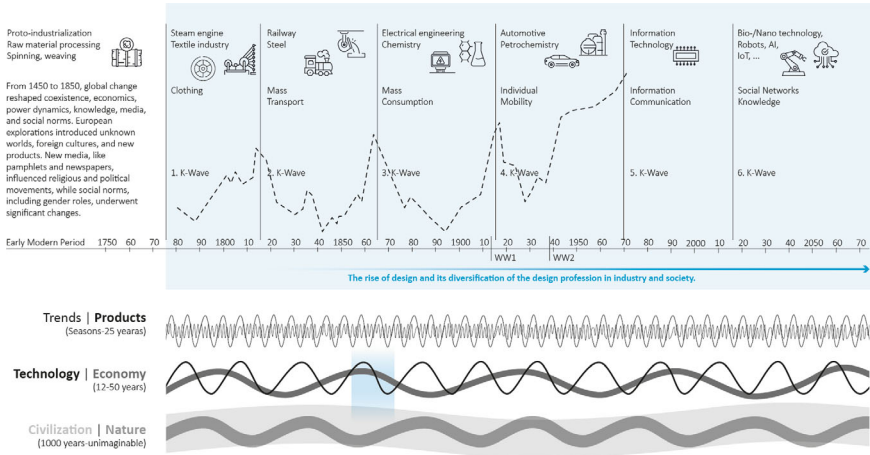


Fig. 3.1 Illustration: based on Kondratieff (1926) and Horx (2011)

change. In this context, design is strategic and functions as an important and central element of interconnectedness of smaller and larger systems.

Finally, the Strategic Niche Management (SNM) framework, as developed by Schot and Geels (2008), offers a nuanced perspective on innovation in the context of strategic design and technological development, particularly through its hierarchical structure of niche, regime, and landscape. SNM posits that innovation begins in niches, small and protected spaces where novel technologies are nurtured away from the mainstream market’s immediate pressures. These niches act as testing grounds for new ideas, fostering developments that are too radical for the current regime—the dominant system of practices and technologies. The regime represents the established order, encompassing the prevailing technical standards, regulations, and user practices. Innovations from the niche level challenge and potentially transform these established regimes by introducing disruptive technologies and practices. Beyond the regime lies the landscape, the broadest level, which includes macro-level factors such as cultural norms, societal values, and overarching political and economic trends. Changes at the landscape level are slower but have the most widespread impact, potentially reshaping regimes and opening up new opportunities for niche innovations. In strategic design, understanding this structure is crucial; designers and innovators can strategically target their interventions at the appropriate level—whether nurturing a niche innovation, challenging an existing regime, or aligning with broader landscape shifts. This tiered approach to innovation underlines the importance of context and scale in strategic design, emphasising that effective technological development requires navigating and influencing these different levels of societal and technological structures.

3.2 Key Concepts

Strategic design in industry and business is a multifaceted approach that integrates design management, systems design, design thinking, business strategy, and technological innovation to create value and competitive advantage. It involves understanding and applying the principles of design to strategic business challenges, thereby enabling organisations to innovate, improve user experiences, and achieve sustainable growth.

3.2.1 *Interrelationship Between Design Management and Strategy*

The last decades have seen remarkable technological progress, transitioning from industrial manufacturing to digital technology and fundamentally altering human-machine interaction and problem-solving. Design management and strategic design act as a bracket, including the practicalities of design thinking and are close to other terms overlapping in meaning and application such as design strategy, design leadership, innovation management, brand and product management, user experience (UX), service design, and design innovation. They all have emerged as pivotal methods in leveraging these advancements, emphasising user-centred design and fostering innovation to tackle complex yet wicked challenges. Inventions like the assembly line laid the groundwork for modern technology, emphasising efficiency and functionality. The advent of electronic computers and the rise of design management in various industries and branches witnessed the digital revolution, where high-tech companies integrated business, technology, and design.

At its core, design management seeks to leverage the creative and problem-solving capabilities of design to drive innovation, improve products and services, and shape organisational strategies. It involves understanding the role of design in achieving business goals, aligning design initiatives with broader organisational objectives, and effectively managing design processes, resources, and teams (Borja de Mozota 2003). Key aspects of design management include strategy and integrating design into organisational strategies and decision-making processes to ensure that design contributes to achieving business objectives. Applying design thinking principles and methodologies to identify opportunities, solve problems, and innovate within the organisation. Providing leadership and fostering collaboration among different stakeholders, including designers, managers, marketers, engineers, and other professionals, to effectively harness the potential of design. Managing design resources, including budgets, talent, and technology, to optimise the use of resources and achieve desired outcomes. Prioritising the needs and preferences of users throughout the design process to create products and services that meet their expectations and deliver value (Baars 2020). Leveraging design to build and communicate a strong

brand identity, differentiate products and services in the market, and engage with customers effectively.

The Kootstra Design Management Staircase (2010) is a conceptual model developed to evaluate design management capability in European companies from the design management institute (DMI). Founded in 1975 in the Netherlands, DMI serves as a hub for design management professionals, academics, and organisations seeking to leverage design practices for industry to foster innovation, competitiveness, and sustainable growth worldwide today. The staircase comprises four levels of maturity that indicate a company's typical behaviour regarding design management. These levels are context-driven, with higher levels indicating greater strategic importance placed on design within the company. Research suggests that companies that strategically deploy design are more likely to experience growth (Best et al. 2010).

The Design Management Staircase illustrates a company's typical design management behaviour across four maturity levels. These levels are context-driven, with higher levels indicating greater strategic importance of design within the company. As an analysis tool to find out whether or not a company sees design as an integrative and valuable activity in the value creation. The model distinguishes between design as a culture, as a function, as a project and no design at all. The respective effects are recognisable and measurable in the everyday life of a company. Best et al. (2010) distinguish between awareness of benefits from design work, planning and resources for design work through to the ability and process of integrating design into the everyday routines.

3.2.2 Bridging User-Centred Design and Socio-technical Systems

These approaches prioritise human-centred design principles, resulting in technologies that are intuitive, accessible, and sustainable, effectively solving real-world problems. The concept of strategic design sits at the intersection of creativity, innovation, and business strategy, fundamentally reshaping how organisations approach problem-solving and value creation. Central to this discourse are the seminal works of Martin (2009) and Brown (2008), which collectively articulate the essence and transformative potential of design thinking in business strategy. This review delves into their contributions, examining how design thinking serves as a competitive advantage in the modern business landscape. Martin's work (2009) presents a compelling argument for the integration of design thinking into business strategy. Martin posits that the complexity and rapid pace of modern business challenges necessitate a shift from traditional analytical thinking to a more creative, design-oriented approach. He defines design thinking as a methodology that balances the exploration of new possibilities with the exploitation of existing knowledge, thus enabling organisations to navigate the ambiguity and uncertainty that characterise contemporary business environments. Martin's thesis is that by embracing design thinking, companies can

unlock a significant competitive edge, fostering innovation and adaptability in a constantly evolving market. Martin's perspective is rooted in a deep understanding of the design process as a unique form of knowledge creation, one that is iterative, user-centred, and inherently optimistic. He argues that this approach not only leads to the development of innovative products and services but also enables companies to redefine their market strategies and business models. By advocating for a design-driven culture within organisations, Martin underscores the strategic value of creativity and innovation in achieving sustainable growth and competitive differentiation. Complementing Martin's insights, Brown's article (2008) expands the definition of design thinking beyond the confines of product design to address broader strategic business challenges. Brown emphasises the user-centric nature of design thinking, highlighting its reliance on empathy, ideation, and experimentation. This approach, according to Brown, is instrumental in developing deep insights into user needs and behaviours, which can then inform the innovation process. Brown elucidates how design thinking facilitates a collaborative and iterative exploration of problems and solutions, encouraging cross-disciplinary teams to engage in a constructive dialogue that bridges the gap between imagination and implementation. By focusing on creating meaningful user experiences, design thinking pushes organisations to think beyond traditional boundaries, fostering a culture of innovation that is responsive to the rapidly changing demands of consumers and the market. The confluence of Martin's and Brown's theories presents a robust framework for understanding the strategic importance of design thinking in business. While Martin provides a macro-level analysis of design thinking as a competitive lever within the broader context of business strategy, Brown offers a micro-level view of its application in fostering user-centric innovation.

Together, these perspectives underscore the multifaceted role of design management using design thinking in driving organisational change, enhancing user experiences, and cultivating a sustainable competitive advantage. The discourse on strategic design as a discipline explores the integration of design principles with management and strategy, offering a nuanced approach to solving complex problems and driving organisational and societal innovation. Junginger's work (2007), marks a pivotal exploration of the confluence between design and management. Junginger articulates the transformative potential of incorporating design thinking into strategic decision-making and organisational change processes. She posits that strategic design transcends traditional boundaries of aesthetics or product development, advocating instead for a holistic approach that embeds design thinking at the core of business strategy. Her work underscores the significance of design in enhancing creativity, fostering innovation, and facilitating a deeper understanding of user needs and behaviours within the business context. By highlighting the role of design in strategic decision-making, Junginger contributes to a broader recognition of design as a critical component of effective management and organisational transformation.

Strategic design for socio-technical innovation emphasises the integration of social needs and technical advancements to address complex societal challenges. It involves a holistic approach that considers human, technological, and environmental factors, aiming to create sustainable and inclusive solutions. This approach leverages

design thinking, systems thinking, and participatory design to ensure that innovations are not only technologically feasible but also socially desirable and environmentally sustainable. Through collaborative processes, it seeks to engage various stakeholders, including users, communities, and policymakers, in the innovation process, fostering innovations that are more adaptable to societal needs and values.

Ezio Manzini's influential book (2015) expands the realm of strategic design into the domain of social innovation. Manzini explores how design principles can be applied to address complex societal challenges, advocating for a participatory approach where design becomes a collaborative endeavour among various stakeholders. He introduces the concept of "design for social innovation," which emphasises the role of design in creating sustainable and scalable solutions that address pressing social issues. Manzini's work is characterised by a deep commitment to leveraging design as a tool for social change, highlighting the potential of strategic design to catalyse collective action and empower communities. By framing design as an inclusive process, Manzini not only broadens the scope of strategic design but also underscores the importance of creativity, empathy, and collaboration in driving social innovation. The exploration of strategic design frameworks and models offers valuable insights into how design thinking can be systematically applied to enhance business strategy and innovation.

Norman's work (2014) serves as a foundational reference in emphasising the critical role of user-centred design in technological innovation. Norman argues that for technology to be truly innovative, it must be developed with the end-user's needs, capabilities, and contexts in mind. This ensures that technological advancements are not only technically superior but also accessible, useful, and meaningful to the people who use them. The principles of strategic design, according to Norman, are instrumental in achieving this alignment between technology and user needs. In his latest work, Norman (2014) extends the conversation around user-centred design to address broader societal challenges and the role of design in creating a more sustainable and equitable world. He advocates for a holistic approach to design that considers not just the immediate needs of users but also the long-term impacts on society and the environment. This perspective emphasises the responsibility of designers and innovators to use strategic design as a tool for positive change, ensuring that technological advancements contribute to a better world for all. Norman underscores the evolving role of design in addressing complex global issues, highlighting the importance of empathy, sustainability, and inclusivity in the design process.

The paradigm shift brought about by technological advancement fundamentally alters the way organisations operate and create value for customers. The challenge lies in optimising technical and social aspects together to create sustainable value and improve work quality. Aligning technical capabilities with social needs forms the basis of socio-technical systems (STS) thinking. In the 1960s, Tavistock (Emery and Trist 1960; Ropohl, 1999) developed the concept of the socio-technical system. The Hawthorne studies explored human and social factors within industrial relations, focusing on individual psychology (Mayo 1945; Ropohl, 1999). It was only with the increasing influence of digitisation through computer systems in the workplace that

the perspective on technology as the sole variable shifted. Humans followed technical structures, and the mental and social conditions of human work could only be marginally improved in some cases (Ropohl, 1999). The reciprocal relationship between humans and machines to unite efficiency and humanity in working conditions is consciously utilised by the system theory to understand the complexity of real situations within the STS approach (Ropohl 1979). Ropohl emphasises the importance of not losing sight of the interplay between science, practice, knowledge, and thought in this discussion (Ropohl, 1999), as most human practices nowadays are influenced by technology. The often-cited interdisciplinary approach also stems from philosophical reflections in connection with system theory. The formation of socio-technical systems offers insights into the impact of technology on society. Each invention represents not only a new artefact but also introduces novel functions, partly substituting human capabilities and partly adding new ones as an intervention into nature and society resulting in social change. Technical development leads to the institutionalisation of human abilities and knowledge, shaping behaviour and culture. Technical products facilitate this process, transferring institutional power to individuals through technical socialisation. However, this can lead to feelings of alienation as individuals may feel overwhelmed by the goals incorporated into artefacts. Technological enlightenment aims to alleviate this alienation by fostering an understanding of technology's role and capabilities (Ropohl 1999).

Accepting the socio-technical approach in system development as it leads to more user-friendly systems with greater stakeholder value, these approaches are not widely implemented. Baxter and Suommerville (2011) propose a framework based on socio-technical systems (STS), the socio-technical systems engineering (STSE), bridging the gap between organisational change and system development. It emphasises sensitisation, awareness, and constructive engagement. They also outline interdisciplinary research problems focusing on cost-effective application and integration with existing engineering approaches. In addition, Govers and Amelsvoort (2023) propose a contemporary holistic approach to design that integrates digital technologies and organisational design into the STS design (STS-D) sequence. It emphasises that digital technology is more than just technology and is an integral part of the design process. Digital technologies offer both opportunities and constraints for organisations and networks in ecosystems and are changing the nature of human work. The argument is made that STS-D theory needs to evolve to incorporate this development and include digital thinking in the design process. Human-machine collaboration is intensifying, and monitoring the quality of work life during the design process is essential. Digital technology blurs the boundaries between organisations, highlighting the importance of incorporating the entire system into the organisational design space. New design routines are necessary to meet the requirements of successful participative design, given changing business needs and diverse stakeholder involvement.

The study from Tortorella et al. (2024) provides manufacturing industry managers with concrete arguments to guide their efforts in fostering innovation through the integration of Industry 4.0 (I4.0) as a socio-technical system (STS). Companies aiming to innovate their products must embrace both knowledge management practices such

as knowledge acquisition, knowledge dissemination, and responsiveness to knowledge (Darroch 2003), as well as I4.0 design principles. However, those focusing solely on developing innovative processes should concentrate their efforts on the discovery of knowledge and I4.0 design principles. I4.0 design principles, along with the technological advancements they entail, enhance the potential of knowledge management to contribute to innovation effectiveness. These impacts are statistically significant, empowering knowledge management as an innovation enabler (Tortorella et al. 2024). Early awareness of these connections enhances competitiveness by enabling companies to anticipate and address potential issues during I4.0 implementation.

3.2.3 Practical Tools for Strategic Design

Liedtka and Ogilvie's (2011) work serves as a seminal resource for managers seeking to incorporate design thinking into their strategic initiatives. This comprehensive toolkit is designed to demystify the design thinking process, making it accessible and actionable for business leaders. Liedtka and Ogilvie present a suite of practical tools and frameworks that facilitate the entire design thinking cycle, from ideation through prototyping and testing. Their work is particularly valuable for its focus on application, offering step-by-step guidance on employing design thinking methodologies to uncover innovative solutions and drive growth. The authors argue that design thinking can empower managers to approach business challenges with a new perspective, one that prioritises user needs and fosters creative problem-solving. By outlining specific techniques for ideation, such as brainstorming and mind mapping, and providing frameworks for rapid prototyping and user feedback, Liedtka and Ogilvie equip business leaders with the means to experiment and iterate their way to success. Their contribution is critical in illustrating how design thinking can be seamlessly integrated into business practices to stimulate innovation and achieve sustainable competitive advantages.

Complementing the practical focus of Liedtka and Ogilvie, Lucy Kimbell's work (2011) presents a critical examination of conventional design thinking models. Kimbell challenges the prevailing interpretations of design thinking, advocating for a broader conceptualisation that recognises design as a complex social practice. Her critique is rooted in the observation that traditional models often oversimplify the design process, neglecting the nuanced interactions between design, business, and society. Kimbell calls for a strategic approach to design thinking that embraces its multifaceted nature, acknowledging the myriad ways in which design influences and is influenced by the broader socio-economic context. She urges a re-evaluation of design thinking's role in strategic business contexts, suggesting that a more expansive understanding can enhance its effectiveness in addressing complex challenges. Kimbell's work is instrumental in expanding the discourse on strategic design, encouraging scholars and practitioners alike to consider the deeper implications of design thinking in organisational and societal change.

The implementation of strategic design in practical settings represents a critical area of inquiry, offering insights into how theoretical principles are applied to drive innovation, enhance customer experience, and address complex challenges in various industries. The works of Karpen et al. (2017), alongside Coelen and Smulders (2023), provide valuable case studies and reflections on the application of strategic design practices, illuminating the conditions, challenges, and outcomes associated with strategic design in practice. In their paper by Karpen et al. (2017), the intricate relationship between organisational capabilities, service design practices, and the resultant experiential outcomes was explored. Through detailed case studies of companies that have adeptly implemented strategic design, the authors present a framework for understanding the multilevel conditions necessary for successful service innovation and enhanced customer experience. This work underscores the importance of developing a portfolio of organisational capabilities that support the integration of strategic design practices. These capabilities include, but are not limited to, cross-functional collaboration, empathetic understanding of customer needs, and a culture of experimentation and iteration. The case studies highlighted in the paper demonstrate how companies can leverage these capabilities to engage in interactive practices with customers, thereby co-creating value and achieving superior experiential outcomes. This contribution is significant for its comprehensive view of the service design process, from organisational preparedness to customer engagement and experience.

Complementing the focus on service design, Coelen and Smulders article (2023), delves into the challenges and opportunities inherent in applying strategic design within complex systems. Drawing on case studies from diverse industries, the authors reflect on how strategic design can facilitate innovative solutions and sustainable practices in the face of complexity. Smulders and Dorst argue that the traditional linear approaches to design and problem-solving are inadequate for addressing the multifaceted challenges of today's complex world. Instead, they advocate for a strategic design approach that embraces systems thinking, enabling designers and organisations to understand and navigate the interconnectedness of various elements within complex systems. The case studies presented in the paper illustrate the potential of strategic design to uncover novel solutions that are both innovative and sustainable, highlighting the critical role of design thinking in conceptualising and implementing change in complex environments.

3.2.4 Systems, Human, and Organisational Design

A system is an arrangement of elements that interact with each other to collectively fulfil a specific function or achieve a particular goal. It consists of components, relationships between these components, a defined purpose, and an environment. Systems can range from simple mechanical devices to complex social structures. System theory is an interdisciplinary theoretical perspective aimed at understanding and analysing complex systems. In Spinoza's considerations on ethics and politics,

he argues that reason is the foundation of human ability to systematically understand the world and act according to the principles of reason. His ethical principles, such as the idea of self-preservation and the pursuit of the highest good, are part of a comprehensive system of human existence and moral conduct (Rombach 2010). General system theory and its application were shaped by Ludwig von Bertalanffy in the 1950s (Bertalanffy 1968), and Niklas Luhmann laid the foundations in the 1980s in the field of sociological system theory (Luhmann 1984a, b). Melanie Mitchell then contributed in 1996 to spreading the understanding and application of genetic algorithms, which are an important component of system analysis in computer science and artificial intelligence (Mitchell 1996; 2021).

Some of the key concepts and tools of system theory include feedback loops, control systems, and cybernetics, emergence, self-organisation, and complexity, hierarchy, and network analysis. These concepts help understand and model the dynamics and functionality of systems, as well as analyse the effects of changes on these systems. Donella Meadows's work in 2008 introduces systems thinking as a crucial component of strategic design. Meadows suggests that understanding the complex systems within which technology, business, and society operate is essential for innovation (Meadows 2008). Systems thinking allows businesses to anticipate and address the broader impacts of their technological innovations, ensuring that these innovations are sustainable and beneficial on a larger scale.

Sanders and Stappers in 2008 advocate for the inclusion of end-users in the design process through user research and co-creation techniques (Sanders and Stappers 2008). The utilisation of systems thinking in strategic design enables designers to contemplate the interconnectedness of elements, dependencies, and the dynamic nature of systems, facilitating a comprehensive understanding of patterns and behaviours within a given context. Applying design thinking strategically will drive innovation and strategic decision-making across various organisations to create value and competitive advantage (Nixon 2020). Mootee covers topics such as scenario planning, business model innovation, and ecosystem design, providing actionable frameworks and tools for driving organisational change (Mootee 2013).

Similarly, the application of systems theory facilitates the perception of organisations as dynamic entities situated within an environment, capable of responding to shifts and alterations. A key principle involves understanding that organisations are open systems, interconnected with their surroundings through the exchange of resources, information, and values. This fosters organisational adaptability and evolution, empowering them to pursue their objectives effectively. The human aspect in innovation from the perspective of change involves understanding how people drive, adapt to, and benefit from innovation. It includes the internal as well as the external view, and besides understanding and prioritising user needs, it is most important to understand change and transformation not only from the solution but also, fostering leadership and communication, building resilience, and embracing diversity for more inclusive and impactful innovation inside an organisation.

Organisational design as part of strategic design plays a crucial role in the effectiveness and adaptability of businesses as it enables transformation for innovation. Scholars contribute to understanding this complex field and describe the effects of

practice, addressing various dimensions such as strategy, structure, culture, leadership, and learning. Naomi Stanford emphasises the importance of organisational flexibility in response to environmental shifts (Stanford 2013). In addition, Galbraith explores the alignment between strategy and structure introducing the *star model* which represents the relationship between strategy, structure, processes, rewards, and people as represented at Fig. 3.2 (Galbraith, 2002). Schein as a key figure in the field of organisational development and culture focuses on behaviour and highlights the significance of understanding and managing cultural dynamics in the context of organisational change and effectiveness (Schein 2004). His work provides practical guidance and tools for leaders to understand, influence, and change the culture of their organisations. The emphasis on the interaction between culture and leadership is particularly important as it helps leaders recognise how their actions and values shape the culture of their organisation. At a time when organisations are increasingly recognising the importance of a strong and positive culture to their long-term success, his work remains highly relevant. Especially when socio-technological aspects change the processes and data influences organisational structures (Slinger and Morrison 2014), the perspective on people in the triangle must be considered together with the system and the organisation as a whole. Scholars from the knowledge management field stress the pillars of human (communication), organisation (processes) and technology (structures) building up on the culture and the knowledge of an organisation led by its strategy (Dalkir 2005; Mandl and Reinmann-Rothmeier 2000). Organisation design involves purposefully arranging structures, processes, incentives, and human resources to establish a functional organisation capable of realising the business strategy. The organisation as a whole serves as a means to achieve strategic goals in a dynamic process of continuous adaptation. In a good way, this can enable all members to perform their tasks efficiently, while a poorly structured or unconsciously designed organisation hinders the effectiveness of the individual (Malik 2014). This closes the circle, whereby the system, the organisation and the individual are in a state of perpetual transformation and adaptation. In order to understand how strategic design is taking effect in organisations, the approach from knowledge and change management is used, which refers to Galbraith's Star Model. The following cases examine how change and the conscious influence on strategy, structure, processes, rewards, and people has an impact on the organisation and its activities (Galbraith 2002).

An *organisation's strategy*, encompassing its vision, mission, values, goals, and objectives, establishes its direction and guides decision-making. As the foremost element in the star model, strategy provides criteria for trade-offs and choices in organisational design.

An *organisation's structure* defines job roles, department sizes, power distribution, and departmental formation. It can be centralised or decentralised. The business model's features determine the best structure. Consider the human capital and activities needed for execution to tailor the structure accordingly.

Organisational processes involve information and decision flows, either vertically or horizontally. Vertical processes manage funds and talent allocation, while horizontal processes focus on workflow through inter-departmental relationships.

Fig. 3.2 The “star model”
(Galbraith 2002)



Reward systems align employee goals with organisational objectives by providing incentives that motivate desired behaviours in line with the strategic direction. It is essential for the reward system to be congruent with other design elements to influence strategic direction effectively.

An *organisation's human resource policy* overlooks recruitment, promotion, training, and development, aiming to cultivate talent aligned with strategic goals. They must align with other design areas and the mindset of the people need to fit their tasks.

While we look at different organisations and their specific challenges in the five fields, it is the task of the strategic designer to understand the organisation, the business and the interplay of these five areas and their relationship. The specific application of design intervention and activity will then support selected areas, such as service design application, human-centred design measures or strategic design management activities to aim at improving the impact of an organisation internally and externally.

3.3 Strategic Design in Industry and Business

When design principles are linked with strategic management, it becomes not just an approach but a framework that enhances the measurability and effectiveness of actions. Depending on the system or systems in which designers operate, the impact changes, and certainly, the role and understanding of design and technology shifts. The acceptance of design activity is appreciated when the resulting outcomes become visible and are useful in the relative environment. But the work of designers

is pivotal in this perspective, as the implementation of technology alone does not help the transformation of an organisation. We only are able to understand the role of technology as a supportive element when we look through it from the human perspective as le Guin said, that “technology is the active human interface with the material world”. The quote also tackles the notion of practices using the design thinking approach, where human-centred design supports the practicality of solutions. However, strategic design is more than just practical, it goes beyond the actual problem-solving as it motivates strategic decision-making and utilises all common practices to achieve this higher goal. The effect of strategic design in organisations varies in the way designerly interventions are implemented and where they aim to influence and change. The activities of design in combination with technology affect the organisational strategy, structure, processes, the rewards system, and people.

3.3.1 Case Study 1: Facilitation for Digital Transformation

The following example illustrates the facilitation practices of a strategic designer in a transformation project assisting an organisation in implementing a digital platform for tracking work steps in manufacturing processes. The digitisation initiative underlying this project is a broader measure aimed at making work processes and associated processes in procurement, HR, order processing, and work preparation more transparent and efficient.

The transformation project spanned several years due to its complexity and the high demands on product quality and regulations. The initial challenge laid in the situation, that the company was not prepared to communicate the impacts of the new platform in a way that could integrate all involved employees. The difficulty lay in making all production steps traceable and reproducible in the frontend of the new system and aligning them with steps in actual production. Additionally, project managers and planning engineers needed training to operate the backend. Since the transition from paper-based production instructions to digital form could not occur directly one-to-one, processes had to be rethought, especially when implementing changes or new procedures. Moreover, utilising the skills and embodied knowledge of employees as a learning source for creative teamwork amidst changes posed a challenge. The embedded knowledge (Lam 2000) of interconnected and complex processes was often underestimated in this context, and strategic decisions had to be made to partially redesign processes and system settings. Decision-making at the strategic level and moderating the entire transformation were crucial to creatively and highly effectively assist in knowledge extraction and the analysis of all processes.

The role of the external consultant was filled by a designer who was primarily engaged for her expertise in corporate and technical communication (Hughes 2002) as well as policy-making (Hunter and Elliott-Kingston 2016). The informal role evolved over time, with tasks and their strategic importance becoming clearer after the initial months. Operational support involved face-to-face analysis of work processes and their compatibility with the new system. Iteratively providing document fragments

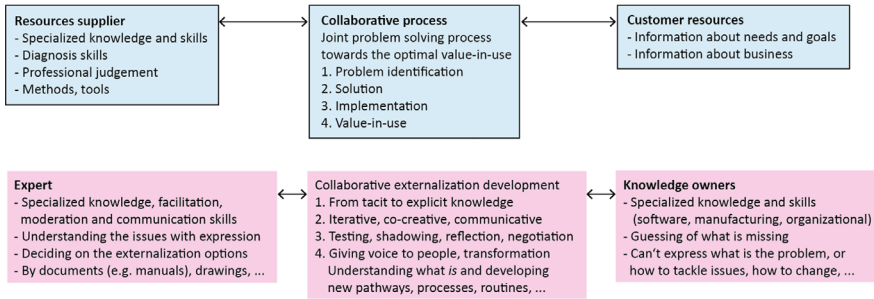


Fig. 3.3 Applied joint value co-creation (Aarikka-Stenroos and Jaakkola 2012)

facilitated shared reflection and served as a medium for extracting tacit knowledge. The strategic elements included using the materials in conversation and positioning the consultant as a coach (Aarikka-Stenroos and Jaakkola 2012) and operational support accessible for all transformation-related queries, operating across different levels of the structure represented at Fig. 3.3 (Tann 2021). The designer was also involved in another capacity, as this project was the subject of a research approach investigating policy-making practice as a strategic tool in transformation. Thus, the designer acted not only as a strategic designer and a coach, but also as a researcher in the field.

For this reason, the investigation employed Participatory Action Research (PAR) (Burian et al. 2010; Kemmis et al. 2014). In this setting to tackle the challenges in a hi-tech environment not characterised by communication, utilising practical approaches in technical and visual communication for policy-making. The long-term study included the development of three guidelines forming the basis for process analysis and organisational learning. Document analysis, interviews, and session recordings provided insights into the transformation initiative. The PAR methodology aimed to understand and address challenges in communication between employees, emphasising participant involvement at each development step. The cyclical guideline development process, observed jointly by researchers and participants, facilitated a co-creative and supportive approach, encouraging social action and transformative outcomes.

In the study, three Action Research cycles were conducted. The facilitation mirrored the participants' perceptions and interaction changes throughout the project. An Activity System analysis (Engeström 1987) provided insights into the internal handling of projects within the complex organisational network. Document analysis (Bowen 2009) was instrumental in comprehending content qualities and the dynamic information architecture based on information types.

The first cycle focused on addressing diverse visual practices and mindsets, offering a foundation for exploring how these practices could support the development of a visual template system for the new systems' application interface. Visualisation and iterative reflection emerged as crucial processes, fostering a visual

culture among engineers. The guideline expert and templates proved supportive when explained gradually, iteratively, and visually.

The second cycle tackled overarching information complexity, particularly the use of guidelines in discussions. Increased project complexity prompted a focused search for an information architecture differentiation, moving away from viewing user manuals as technical documents only. Guideline fragments became a strategic tool, fostering a discussion culture that actively experienced transformation.

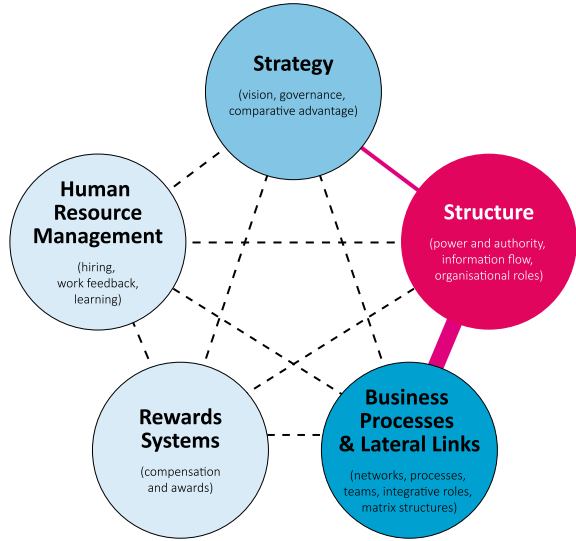
The third cycle centred on dealing with professionals, developing principles, and ensuring scalability. After software adjustments, two guidelines underwent substantial revisions. User groups were redefined, and three guidelines for different work levels were established. Insights into varying competencies based on roles emerged. Facilitation aimed at simplifying complexity through a co-creative, visual, reflective, and personal process. Guideline delivery scope was adjusted to emphasise the development of principles, making the transformation more manageable.

In the study, the challenges stemmed from a lack of meta-skill (Choudrie and Selamat 2006; Selamat and Choudrie 2007; Tsoukas 2009) and limited flexibility in verbal and visual communication culture within the organisation. The guideline expert was brought in during the ongoing implementation of a new system to simplify communication and highlight system benefits across different work levels (Freytag and Storvang 2016). The role evolved from point-by-point support to a process-oriented flow, aiding work analysis before the application's use. Using a visual approach to analyse work routines in a highly technological environment presented both promise and challenges due to the industry's lack of an active visual sharing culture. The guideline expert faced the challenge of flexible and deliberate facilitation, supporting the project's progression. The facilitation role extended beyond content reproduction to a joint, iterative problem-solving process structuring interaction between the expert and employees.

The study addressed two key challenges: facilitating the re-processing of routines and redefining them as newly set routines in the new system and organising the information architecture of guidelines for new employees. Methodical testing of guiding fragments facilitated preliminary work for digitisation, breaking down barriers to knowledge sharing. Guideline-oriented facilitation emerged as an empathic and respectful one-to-one interaction to externalise knowledge, promoting iterative human-based facilitation for looped learning. Empowerment through one-to-one interactions led to co-creative joint problem-solving, showcasing improved organisational effectiveness. All project actors were viewed as resource integrators in the complex information network, contributing interactively to knowledge and skills. Developing principles for system use supported staff learning to tackle future challenges.

The strategic design approach in the described project offers an action framework for facilitating work process analyses, forming the foundation for a system capable of addressing complex challenges and fostering a comprehensive contextual understanding of knowledge and information architectures. The approach operates within the organisation between process management, departmental structures and business

Fig. 3.4 The influential position of structure within the “star model” (Galbraith 2002)



strategy within specific knowledge spaces, establishing principles for an organisational learning culture. The approach, which involves all employees from production to management, promotes long-term transformation and sustainable growth, as a people-driven process for further implementations of information architectures, be it for the development of new workflows, employee training or subsequent stages of digitalisation (Fig. 3.4).

The strategic designer supports employees in their diverse tasks, expressing their needs, and assisting in the analysis of their externalised knowledge. It may be necessary to delve deep into workflows to understand them from the bottom up. The support provided by strategic design contributes to making project management for digital transformation feasible by reducing rework or re-planning and fostering employee integrity during the transformation. In such projects, it can also be utilised to support the training of employees in various roles. Working as a strategic designer is characterised by the use of moderation techniques and guideline practices as steering tools for facilitation, enabling implementation from the shop floor to management (Steen 2013).

The involvement of strategic design in projects of this nature depends on the available space for facilitation as isolated work without involving employees poses challenges. The design practice in this study requires integrative awareness and flexibility to tackle issues. Direct involvement, fieldwork, shared experiences, and project-aligned goals enhance relationships and promote meaningful communication across boundaries. The design expert plays a key role in these co-creative processes, as it must be self-reflective, adaptable, negotiable, and capable of trans-shaping meaning, facilitating a transformative impact. Organisations perceive strategic designers as change agents fostering new insights and perspectives into their system. Strategic designers, deeply integrated and leveraging design-based skills, contribute to broader,

human-centred understandings of processes. Through facilitation, they play an active role in transformation initiatives, guiding organisations towards a more enlightened perspective.

3.3.2 Case Study 2: Strategic Design for Greener Pensions

This case study represents a project, which enables pension savers to see the impact of their investments towards climate risks. Fingon is an API platform aiming to foster alignment between individuals' and companies' values, with the aim of promoting sustainable investment in workplace pensions. It is designed by a group of service designers (Aishwarya Londhe, Mugdha Attarde, Aishwarya Bhawe, Mingwei Ma, Xiangyue Deng) in the Royal College of Art, in partnership with Aegon, a financial services group, one of the UK's largest investment platforms and workplace pension schemes (<https://www.aegon.co.uk>). Announced by the Department for Work and Pensions, UK pensions will soon be required to measure and publish how their investments support the Paris Agreement climate goals to tackle climate risk (<https://www.gov.uk/government/news/new-measures-to-propel-superpower-of-pensions-in-uk-s-net-zero-journey>). For the first time, pension savers will be able to see the impact of their investments and better understand how climate risks are being considered and mitigated, via climate risk reports published by their pension scheme. This is believed to help pave the way for greener pensions amid an economic transition to net-zero that will create the opportunity to invest in green businesses, support jobs for the future, and ultimately help grow a stronger and more sustainable economy. The sector needs to reinvent services, going beyond the basic transactional services towards more smart and relational systems based on using data, AI, and other enabling technologies and business models to capture this opportunity for transformation. One of the challenges for pension providers, like Aegon, is to engage pension savers (organisations and their employees). Fingon is designed under this context.

Through user research, the design team found that lacking engagement presents a challenge. Majority pension savers do not feel that they have a say in pension investments and are unaware of the potential impact they could make through their pension choices on sustainability and climate change. Aegon is developed as a reward system that aligns the goals of employees with this goal of the organisation. For organisations that are committing to delivering net-zero and influencing the societal transition towards this ambition, pension investment is a fundamental pillar to achieve the strategic goal. The reward system Fingon enables the organisations to collaborate with the employees working towards the strategic direction. As shown in the following illustration, a rewarding system process Fingon creates enables the organisations and their employees to align and reinforce their values. The rewards include the revealing of a relatable future for individuals, a sense of empowerment in making investment decisions, and it creates a community using healthy peer pressure for engaging in climate actions through pension choices.

In this context, Aegon developed a design brief seeking ideas to communicate this strategic vision to their clients and to engage them (Fig. 3.5). The group of designers took on this challenge and developed Fingon. They followed a typical design thinking process of Double Diamond: discover, define, develop, and deliver. As the strategic goal of this market is for GenZ and millennial generation, they have interviewed a large number of potential users in this category. They run co-creation workshops with different stakeholders in the system to understand the challenges and opportunities for intervention. These include pension providers, regulators and HR in client organisations. The idea was iterated based on feedback from experts in business development and systems thinkers from London Business School. They validated the Seven-step-process with Aegon further once the detailed UX/UI was developed as shown in the following figures.

New initiatives in the UK are enhancing pension schemes with a focus on addressing climate concerns. These initiatives mandate pension schemes to assess and disclose how their investments contribute to the Paris Agreement’s objective of limiting global warming to 1.5 degrees Celsius above pre-industrial levels. This

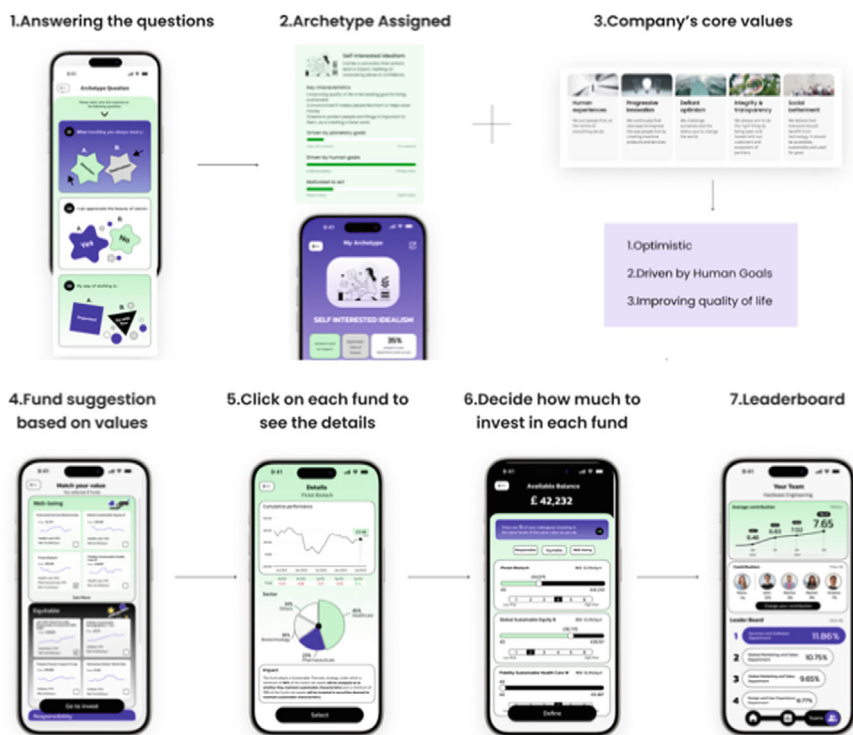


Fig. 3.5 Seven steps of the rewarding system process (Source design work by Aishwarya Londhe, Mugdha Attarde, Aishwarya Bhawe, Mingwei Ma and Xiangyue Deng as part of the project to communicate how the service engages with the users. ©2023)

marks the first instance where pension holders can observe the impact of their investments and gain insights into how climate risks are being managed through climate risk reports issued by their pension schemes. Coupled with existing climate regulations, these new measures will extend coverage to over 80% of UK pension scheme members starting October 2024. This move is instrumental in fostering environmentally conscious pensions amidst a shift towards a net-zero economy. It presents opportunities to invest in green enterprises, bolster future employment prospects, and ultimately promote the development of a resilient and sustainable economy (<https://www.gov.uk>).

Recognising the urgency of supporting the climate transition in emerging economies, 12 leading UK pension funds collaborate to explore how greater impact could be achieved through a shared understanding of the need, opportunity and mechanisms to provide such investments in these markets. This industry is in a phase of disruption which presents massive opportunities to reinvent services, going beyond the basic transactional “products” of bank accounts and mortgages etc. to services that are smart, and more relationship based using data, AI and other enabling technologies and business models.

Aegon is a globally oriented financial services conglomerate with a comprehensive range of offerings. Its UK division specialises in delivering pension, savings, and investment solutions to a customer base exceeding 4 million individuals over their lifetimes. This is achieved through collaboration with financial advisors and employers, positioning Aegon as the largest investment platform in the UK. They administer workplace pension schemes for more than 9000 employers, facilitating their employees’ financial planning needs. *“Our approach is to see financial services from the perspective of humans and society and what people need to live their lives feeling empowered by money”* (Aegon 2023) Aegon believes that pensions could positively impact the climate crisis at various levels. Despite being relatively unexplored, there are diverse pathways, from practical interventions to systemic approaches, within pension schemes (Aegon 2023).

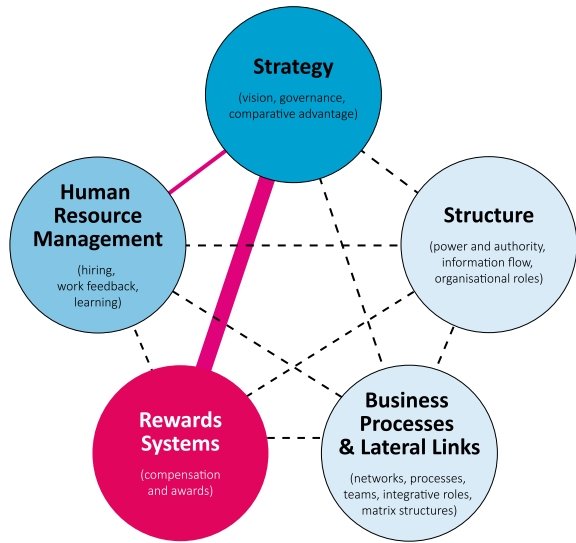
One of the pathways is to use reward systems. They aim to synchronise employees’ objectives with those of the organisation. These systems should employ suitable incentives to encourage employees to undertake actions that align with the organisation’s strategic aims (Schuster and Kesler 2011). It is essential for the reward system to harmonise with other aspects of organisational design to effectively shape strategic direction. Various business models necessitate distinct reward systems. For instance, if the business model revolves around customer satisfaction, the reward system should mirror this dedication. Conversely, if the model relies on a direct sales force to attract new customers, the reward system should prioritise performance (Table 3.1). As Schuster and Kesler (2011) indicate that the rewards systems alignment should include at least three following elements: [a] *Strategic drivers* (inputs to design thinking), [b] *Rewards philosophy and objectives* (core design decisions) and [c] *Compensation delivery mechanisms* (Fig. 3.6).

The project Fingon enters the strategic impact of the solution by offering the opportunity for employees to align with the organisational goals and objectives. Based on a pre-selection of green funds made by the HR department, the interactive

Table 3.1 Using Schuster and Kesler (2011)’s framework to summarise Fingon

Rewarding system	Fingon
[a] Strategic drivers	Commitment to sustainability & climate actions
[b] Rewards philosophy and objectives	<ul style="list-style-type: none"> • A relatable future • A sense of empowerment in making investment decisions, • A community and peer pressure for engaging in climate actions through pension choices
[c] Compensation delivery mechanisms	Fingon API platform (each of the 7 steps)

Fig. 3.6 The influential position of a rewards system within the “star model” (Galbraith 2002)



platform allows employees to define their own values and choose from the range of pension funds themselves. They contribute to a relatable future and are empowered as making their own investment decisions. With these options and with the support of the employees, the organisation is able to follow up on their goals towards the Paris Agreement to tackle climate risk. Participating in this programme as a company also contributes to employer branding. Although initiatives of this kind are often associated with green washing, this approach is nevertheless new. The programme will realistically pay off after some time, even though investing in green funds is still considered risky, it has been shown that investing in green pension funds will pay off in the long run.

As companies become increasingly sophisticated in utilising organisational design as a crucial tool for enhancing business, initiatives such as the UK Initiative on Paris Agreement contributions can play a role in considering external factors within the business ecosystem. It is understood that aligning the right measures and reward

systems with structure and process is important for organisational design. However, reward systems are often overlooked during the design process (Schuster and Kesler 2011). The example described illustrates that it is possible to make a strategic contribution within a company through the use of service design, which has a strong impact on both the company's and society's strategies.

3.3.3 Case Study 3: Innovation by Changing Perspectives

This case study examines the impact of design-based interventions on the human perception within a human-technology interaction of operational processes in a product-service system. DAIKIN Airconditioning Germany is 1 of 16 affiliates to DAIKIN Industries Ltd., a global corporation in Japan. To provide products and services, it uses five partially connected internal service platforms, several clouds and additional web applications to manage customer and employee interactions, master data and business transactions in accordance with international, e.g. International Organization for Standardization (ISO) and Japanese Sarbanes–Oxley Act (J-SOX) standards. The focused business unit attending the study provides air conditioning, heat pumps, air handling units, refrigeration, and accompanied services. However, the used IT services are not sufficiently aligned with product-, pre-, and after-sales services. This uncovers unmet needs of customers and employees, who support the transformation that the organisation plans to achieve, while facing multiple market pressures and managing strategically far-reaching innovations and awaited European government decisions that are relevant for value creation.

Evaluations on customer feedback also raise questions, how well-informed customers and product users can be served, while externally available information in the internet on specific product features and publications mislead meaning and customer contacts into the organisation are not available during services. As a consequence, on-site service technicians, back office support, and administrative employees need the ability to question and comment and also be provided with customer specific data to meet communication demands, especially when questions are not clearly communicated.

To improve operations, services, and customer satisfaction, a multidisciplinary project including agile methods and participatory designs is taking place. The project extends over four months with six consecutive workshop days, and it aims to strategically reformulate and intervene stressing procedures, fragmented, unaligned processes with tasks and customer contacts, that affect employee wellbeing and inefficient operations between teams and business units, which result in an undirected awareness for customer interests. The project owners have supervisory roles and frame the project. Back office staff members contribute with operative and strategic empirical values. They origin from five individually operating teams with no experience in agile frameworks or design methods. These are offered by a trained internal moderator and an internal design consultant.

The suggested service and experience co-creation activities help participants bond, take agency to formulate distinct goals, reframe contexts, and define tools for problem-solving and operational service improvements whilst minimising customer effort. Customers' experience, and specifically the design, how customers should be able to move through the customer life cycle, is a hugely powerful tool to align roles, departments, or functions. When people and teams are not adding value for the customer, it may also create unnecessary work. The worst case scenario would even be to reduce the overall value of the offering if the customer is prevented from achieving their needs and goals.

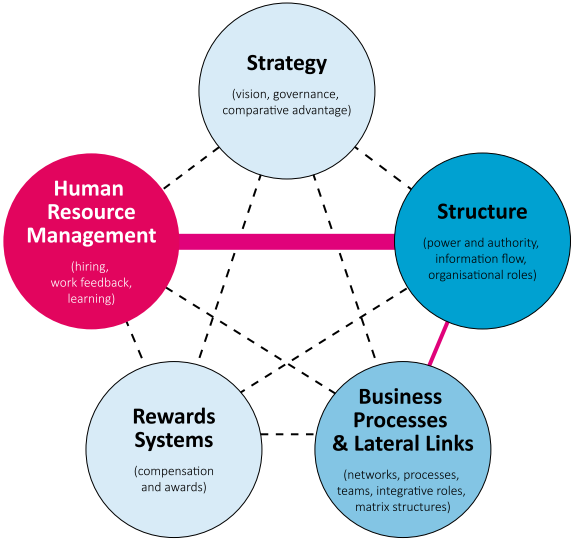
The design of the workshops uses embodiment methods, as they offer a greater sense of security for participants to help articulate personal, more empathetic customer needs as employees and additionally find agreement on community needs. They may also help to keep distance during analysis of distinctions for the different perspectives and emotional involvement during complex scenarios. Scharmer (2016) describes in his *Four Field Structures of Attention* the shift from experiencing a social system into the social field as acting from the relational field structure beyond one's organisational boundaries. The shift offers an experience of self-acting from the generative field structure as emerging sphere across one's open boundaries within the social field. Depending on the source of attention and awareness we operate from, we affect and facilitate different social dynamics and patterns depending on the boundary of the system (Scharmer 2016). The definition of boundary between *us*, as participants and change agents opposed to *them* as customers is a phenomenon during co-creative processes. Constantly changing perspectives to affected actors as observers are mentioned as a *Tetralemma* in SySt organisational consultants (von Kibed 2005), where opposing positions *either/or* offer a dynamisation, when both positions are taken as a possible third option. The fourth position in the Tetralemma neglects all others with *nor* and is perceived as the most disruptive. Overcoming a collectively decided *nor* can be most valuable, because it challenges participants to figure alternative perspectives and solutions that have not been discussed. By moderating differences and similarities in needs as well as more common solutions in a first attempt, we provoke thought and motion that considers more likely the whole, including unrelated and rather surprising options. However, participants are provided clear orientation through rigid timing and guided framing of problem statements, when needed. Learnings are valued as team achievements, to confirm the contribution from the first-person view transitioning to a collective and creative effort by the group.

For the employees in this study, rather than receiving instructions as part of a structured, recursive, fixed, problem-driven system (Simon 2018), this work is expected to provide a distinctive understanding of their own role descriptions. In this as being part of an internal community, serving an external community in an evolving carbon neutral heating, cooling, and service market environment, they are also partaking as users. The adapted *Loop Approach* by Klein et al. (2019) adds the evolution to a circular motion that has an open end starting with clear directions, well-used potential, distributed responsibility, individual efficiency, efficiency as a team, adaptability and competence for feedback and conflict resolution. Business processes and lateral

links will be informed by the outcome (Klein et al. 2019). Similar to Scharmer (2016), Wahl (2016) explains the transition, collaborative design enables for all participants, positioning themselves *on the planet* and changing the *narrative of separation* into the *narrative of interbeing*, embracing our experience of being separate individuals not as proof of separation but of being undividable from the wholeness of nature, thus enabling a re-evaluation of all social and technological achievements as a natural process. It should be a public dialogue when, where and how these *systemic* tools are used in ways that create conditions conducive to life (Wahl 2016).

The workshop is designed based on experiences of *The Loop Approach*, systemic design and systemic organisational consultancy field. The main aim of the intervention is to draw employees’ attention to their own perception and the perception of others in order to sensitise communication practices. The outcome of the workshop series is an interim solution to enable stability and confidence in the company’s own actions, as the organisation will undergo a major IT-based transformation in the following years. Here, the workshop leader takes on the role of a coach who aims to lead the participants to a change of perspective and the associated changes in attitude. This change of perspective therefore enables employees to deal with changes in requirements more quickly and confidently. For this reason, the strategic designer in the role of a coach is acting mainly in the area of human resources and aims to influence behavioural aspects in relation to structure and business processes (Fig. 3.7).

Fig. 3.7 The influential position of human resource management within the “star model” (Galbraith 2002)



3.3.4 Case Study 4: Sustainability Housing as a Living Lab

Strategic design in the context of Living Labs offers a powerful approach to innovation and problem-solving, integrating design principles with strategic objectives to create impactful solutions in real-world settings. Living Labs, as platforms for innovation that engage users in the development process within their natural environment, provide a unique opportunity for the application of strategic design.

Manzini (2015) and Sanders and Stappers (2008) highlight the importance of user-centred design and co-creation in fostering innovation that is deeply rooted in the actual needs and preferences of users. Furthermore, Buchanan (1992) and Brown (2008) emphasise the significance of systems thinking and iterative prototyping within strategic design, advocating for a holistic view of problems and solutions as well as a process of continuous refinement based on user feedback. These approaches ensure that innovations are not only technically viable but also socially relevant and strategically aligned with broader organisational or societal goals. Additionally, Koppenhagen et al. (2024) discuss the role of strategic design in ensuring sustainability and long-term impact, arguing for the creation of solutions that are environmentally sustainable, economically viable, and socially beneficial. This body of work collectively supports the integration of strategic design principles in Living Labs, highlighting the potential for these environments to produce innovations that are user-centred, strategically aligned, and capable of making a positive and sustainable impact in real-world settings.

The HSB Living Lab serves as a case study for the application of strategic design in the context of sustainable living and the housing sector. The HSB Living Lab, located in Gothenburg, Sweden, is a collaborative project initiated by HSB, one of Sweden's leading housing cooperatives, in partnership with Chalmers University of Technology, Johanneberg Science Park, and several industry partners. The primary objective of this living lab is to explore and develop sustainable living solutions and innovations in a real-world residential setting.

The HSB Living Lab embodies the principles of strategic design through its user-centred approach to innovation and sustainability. It functions as a residential building where students and researchers live and work, allowing them to test and evaluate new technologies, materials, and designs aimed at enhancing sustainability in living environments. This living laboratory is equipped with advanced monitoring systems to gather data on energy use, indoor climate, and resident behaviour, providing valuable insights that inform the development of sustainable living solutions.

The HSB Living Lab's strategy focuses on sustainable living and innovation within the housing industry. It aims to develop sustainable solutions that are practical, scalable, and enhance the quality of life for residents. This strategy dictates a vision that guides the Living Lab's activities and creates a comparative advantage over traditional housing development models by prioritising sustainability and user involvement in the design process.

The organisational structure of the HSB Living Lab is designed to facilitate collaboration and information flow between various stakeholders. With a flat hierarchy that

Fig. 3.8 The influential position of strategy within the “star model” (Galbraith 2002)



encourages communication across different levels, the structure supports the power and authority of teams to make decisions that advance the strategic goal of sustainable living. This is evidenced by the cross-functional teams involving residents, researchers, and industry partners who work together within the Living Lab.

The HSB Living Lab incorporates integrative roles and lateral links that cut across traditional departmental lines to enhance business processes. The networks and matrix structures within the lab enable the integration of various disciplines, from engineering to social sciences, ensuring a comprehensive approach to design and innovation. These processes facilitate the testing and refining of ideas in a real-world context, allowing for the rapid development and implementation of sustainable solutions.

By applying the star model to the HSB Living Lab case study, we can see how the Living Lab’s focus on sustainable living through user-centric design, cross-disciplinary collaboration, and innovative business processes aligns with the strategic goals of HSB. The Living Lab serves as a microcosm of the broader company’s commitment to sustainability, reflecting how strategic design can be incorporated into industry and business to achieve significant practical outcomes (Fig. 3.8).

3.4 Discussion

The cases illustrate where design affects organisational aspects such as strategy in product and service development, as in transformation projects affecting the change of routines and structures, as well as intervening employees’ perspectives and rewarding employees by empowering them in the pension funds selection. The

star model (Galbraith 2002) from organisational design intersects with various design practices and serves as a tool to understand the influence of strategic design in organisations (Fig. 3.9). The cases show that the effects of design interventions have a strong influence on processes and structures and thus also control the corporate strategy. The interlocking of the five aspects under the influence of technological transformation is another factor that has a strong influence on the dynamics of these aspects.

Today we know more than ever that an organisation can never act alone, because as such it acts in a network with other external forces and influences. Thus, we view the organisation as a system within a network of systems and design no longer acts selectively to help an organisation increase its sole market position and maximise profits. The examples also show how design works strategically, how it supports the value creation, but also considers the overall context of the organisation internally and externally. The end consumer is the one who questions the systems and companies have to stand up to these queries. For example, technological disruption, the energy transition, and issues surrounding resource optimisation are aspects that force companies to change their strategy. Technology as a supportive element in business operations processes does strongly affect organisational structures and the human aspects are at front, when we are looking into transformation. Therefore, the internal interwoven network of strategy, structure, processes, rewards, and human resources needs to be considered in the same way as the external influences, as a stable and healthy organisation can only tackle challenges when all these elements dynamically work together.

Today, as designers do not just focus on a single product, individual service, or usability; rather, they consider the entirety of the organisational system and its context. Therefore, strategic design, with all its practices, influences the organisation to take on new perspectives. This is particularly important as we look into a digitally influenced and controlled future in which the interaction between humans and technology will continue to evolve as a dynamic element. The ability to change perspectives and transform the benefits of technology into a sustainable state for humanity will be one of the main tasks of mankind.

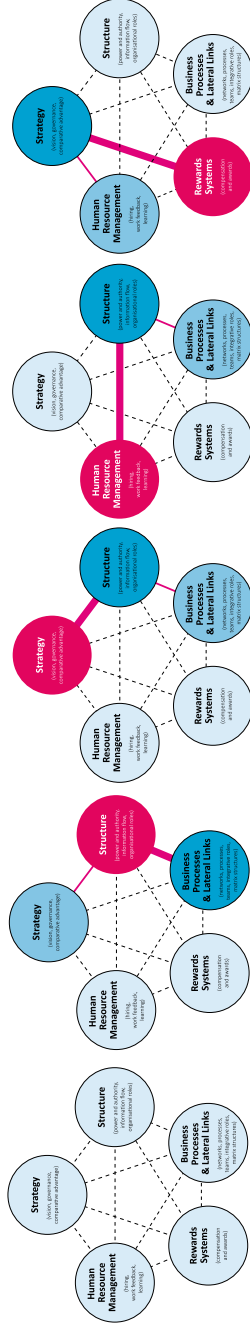


Fig. 3.9 The influential positions from all cases within the “star model” (Galbraith 2002)

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