Electronic Markets (2025) 35:27
https://doi.org/10.1007/s12525-025-00771-1

POSITION PAPER

# Continuous value shaping: A boundary concept for innovating service innovation approaches

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Received: 27 June 2024 / Accepted: 17 February 2025 / Published online: 1 April 2025
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**Abstract**
Technological advancements and evolving value orientations reshape future value creation and pose new requirements for service innovation. While a variety of disciplines are developing new approaches to drive service innovation, this is primarily done in isolation and generates only fragmented solutions. Sociological theory has proposed "boundary objects" as an effective umbrella for communication and cooperation among communities. Therefore, we introduce continuous value shaping (CVS) as a boundary object describing service innovation approaches along five principles. We reflect on this concept through the different disciplinary lenses of researchers in service marketing, information systems, service engineering, sociology of work, and innovation management. These perspectives highlight how the CVS principles already connect to discourses within the individual disciplines. However, the CVS concept will not only provide an umbrella to embrace existing activities in different academic disciplines. It also assists to identify research themes that will benefit from uniting the power of these disciplines, and it can serve as an integrating framework to conceptualize complex service innovation approaches. Thus, the CVS concept should guide both researchers and practitioners to develop and implement novel innovation and transformation efforts—in and across organizations.

**Keywords** Continuous value shaping (CVS) · Service research · Service innovation · Digitalization · Sustainability · Interdisciplinary research

**JEL Classification** M10 · O30

## Introduction

Over the past decade, the landscape for fostering successful innovation and maintaining competitiveness among economies and organizations has undergone a profound transformation. In particular, rapid advances in digital technologies, including the application of (generative) artificial intelligence, have disrupted traditional patterns of value co-creation. At the same time, new individual and societal value orientations, like sustainability, or resilience, are gaining ground and require new approaches to value co-creation (Satzger et al., 2022).

In various disciplines, fragmented novel innovation approaches have been developed, tested, and implemented to address these changes. For example, the innovation management community has pushed design thinking methodologies to better adapt solutions to customer needs (Anderson & Ostrom, 2015; Anderson et al., 2013; Wiesche et al., 2018), service marketing has promoted transformative service research to nurture well-being and inclusion (Anderson & Ostrom, 2015; Anderson et al., 2013), and information systems and service engineering have called for comprehensive approaches like smart or advanced system engineering (Heinz et al., 2022a). However, the strengths of different disciplines have not been connected so far, lacking a common

Responsible Editor: Nils Urbach

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vision and suitable conceptual bridges. As an analogy, we may look at the the popular discussion around "software-defined vehicles" (Liu et al., 2022): While German manufacturers still advance and operate with isolated controllers, Tesla uses a central IT backbone (a "boundary concept") that enables to design compatible controllers with the bigger picture in mind and to realize synergies between them.

We strive to achieve a similar effect for service innovation research by proposing continuous value shaping (CVS) as such a boundary concept for different disciplines. The general notion of a boundary concept is inspired by sociological theory that has developed the construct of boundary objects as "translation devices" (Huvila et al., 2017, p. 1808) to facilitate cooperation between different groups (Karsten et al., 2001). These objects "[…] are both plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity […]" (Star & Griesemer, 1989, p. 393). The notion of boundary concepts has subsequently been expanded to nonphysical objects to include "visionary objects" (Huvila et al., 2017, p. 1808) and has been applied to various domains, including information science (Gal et al., 2008; Huvila et al., 2017) or IS (Beverungen et al., 2019b).

With this paper, we elaborate CVS as such a (boundary) concept by outlining five principles for contemporary innovation approaches. We then invite researchers from different academic communities engaged in service innovation (service marketing, information systems, service engineering, sociology of work, and innovation management) to reflect on CVS and present their disciplinary perspectives. We explain how the five principles of CVS can combine their views from so-far unconnected research streams to provide an integrating perspective for future service innovation research. Moreover, we identify fields where the CVS principles are able to unite the power of the separated research streams of service innovation—expecting them, in particular, to advance research on digital platforms and ecosystems, smart services, transformative service research, as well as on open and agile methods of service innovation. Finally, we provide a forward looking example of how CVS is suggesting avenues for future service innovation research and illustrate its potential for the twin transformation of digitalization and sustainability.

## The principles of continuous value shaping

First, we outline CVS in terms of five principles along two dimensions (Fig. 1) and then illustrate it with an example. These principles reflect collecting existing and adding novel considerations around the ways innovation may generate new types of value-creation. The first dimension is described as the *value* dimension of service innovation and emphasizes the extension and normative framing of value co-created in

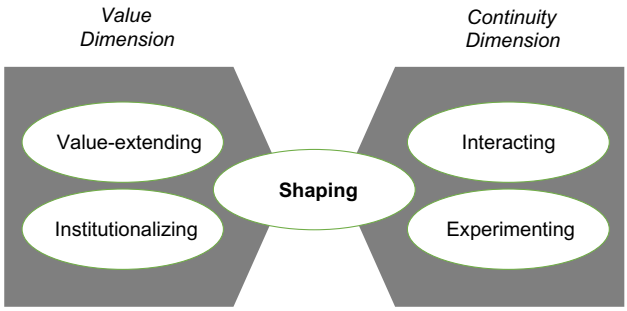


**Fig. 1** The five principles of continuous value shaping

service. Its first principle of *value-extending* service innovation expects value co-creation to target societal goals beyond immediate economic advantages. Such contributions could address ecological and social challenges, such as decarbonization (United Nations, 2023), circularity (Fehrer et al., 2023), data sovereignty (European Commission, 2023), or the well-being of humans (Anderson et al., 2013). The act of balancing and trading off individual actors' values in complex ecosystems may need to embed service innovation into an institutional context: Thus, as a second principle, we posit that service innovation needs to address open-ended *institutionalizing* processes to incorporate changes in the institutional frameworks guiding individual behavior and collective action (Lawrence et al., 2011; Vargo et al., 2023). Novel and digitally enabled services may enter unchartered terrain and invoke societal debates regarding a sustainable path forward, as witnessed for example in the space of climate change mitigation (Engels & Marotzke, 2023) or AI (Buiten, 2019). Therefore, service innovation may invoke the creation and evolution of rules and norms that guide the behavior of all actors involved in value co-creation (Vargo & Lusch, 2016). For example, sustainable forms of mobility may require adapted rules for governing traffic and transportation and new norms framing individual mobility behavior and use of mobility services.

While the value dimension reflects addressing new objectives, including societal and ecological challenges, digital transformation has fundamentally altered the dynamics of innovation *processes*. The generativity of digital systems and an increasingly dynamic exogenous environment has led to inherently volatile outcomes of service innovation. The *continuity* dimension of CVS and its principles reflect these new dynamics by envisioning CVS as a permanent approach of learning. As a third principle, service innovation needs to constantly evolve through an *interacting* process of advancing service innovation in use. This matches the opportunity for ongoing evolution afforded by digital technologies (Beverungen et al., 2018; Boes & Langes, 2023; Heinz et al., 2022c). Ubiquitous, connected, and data-driven service systems can create an unparalleled transparency of usage and, thus, provide insights into how value is

generated by multiple economic actors (Beverungen et al., 2019a). This facilitates a deep understanding of the activities underlying value co-creation processes. Moreover, the generativity and flexibility of digital technologies enable continual adaptations in response to new learning regarding the use of a service innovation (Lusch & Nambisan, 2015). Similarly, rapid technological advancements in the space of digital technologies create a hyper-dynamic environment in which service systems may quickly lose function, effectiveness, and, thus, competitiveness, as witnessed by the emergence of Generative AI. As such, a continuance of an interactive exploration through intervention in use is a core principle of CVS. Further, exploring and creating economic and societal value also requires that service innovation influence the behavioral change of individuals and organizations; thus, understanding how to induce such change becomes a critical success factor for service innovation. This, as a fourth principle, service innovation should be supported by careful and data-driven *experimenting* in real use. Experiments can be situated in the field, not only in the lab, thereby affording much richer insights into the effectiveness of interventions. In such a process, the next development steps are guided by a hypothesis on what value-creating services might look like, which is then tested as quickly as possible in the market and with the user. In conjunction with ongoing innovation activities, a continuous stream of new development hypotheses is generated and tested in the actual application environment. The insights gained enable decisions regarding beneficial and effective service components that are incorporated into service offerings. In addition, the advance of digitalization has brought about new possibilities for a more data-driven and experimenting approach to service innovation that, unfortunately, often remains only insufficiently addressed (Antons & Breidbach, 2018; Boes & Langes, 2023).

These four principles are connected via a fifth integrative one. We posit that processes of service innovation shift from a linear service design approach toward a process of ***shaping*** service innovation through a succession of repeated interventions in open and dynamic service ecosystems. Recent literature emphasizes that, for radical innovation, markets typically do not exist at the beginning of the innovation process; it requires novel institutional frameworks for radical innovation to succeed (Humphreys & Carpenter, 2018; Nenonen et al., 2019). Shaping brings about not only the core innovation but also the conditions for innovation success (e.g., Fehrer et al., 2023; Vink et al., 2021)—both ex ante and ongoing, based on continuous observations (e.g., Wiesche et al., 2024). These conditions refer to institutions in the form of technical standards, legal frameworks, or the results of social negotiation processes. In this respect, the shaping principle integrates the notion of the value-extending and institutionalizing principles with the interacting and experimenting approach afforded by digitalization. By understanding service innovation through the lens of shaping, we depart from a deterministic process of engineering: While such activities can be a valuable part of generating service innovation outcomes, we recognize that this view is not sufficient to comprehensively address the challenges of driving the service innovation process in a more open, volatile, and value-oriented environment, particularly when groups of social actors—rather than formal organizations—are the ones who actively shape markets (Breidbach & Tana, 2021) or change worldviews (Riemer & Johnston, 2019).

To illustrate the principles, let us consider the case of sustainable mobility with a value proposition to reduce the carbon footprint of mobility (value-extending). Regional mobility providers are exploring the benefits of interconnected mobility that not only includes traditional mass transit options but also novel individual mobility solutions, such as car sharing, ride sharing, or bike and scooter sharing. One direction of this innovation space could be to explore which services to integrate and how to realize this integration. Integrating mobility providers with significantly different business models and technical systems creates substantial challenges that require a willingness to change across all actors, both institutional and technical (institutionalizing). Similarly, such sustainable mobility solutions need to explore how such offerings can change user behavior in the systems so that the mobility carbon footprint is reduced. Innovations in this area may involve trying out different ways of combining various services and of charging for such combinations (interacting and experimenting). The overall value-extending service develops over a long series of such interacting and experimenting innovation moves that form the value proposition and the institutional environment (shaping).

## Disciplinary perspectives on continuous value shaping

The following chapter presents a discussion of the CVS concept from the perspective of different academic disciplines engaged in research on service innovation: service marketing, information systems, service engineering, the sociology of work, and innovation management. The authors of each sub-chapter are indicated in a footnote.

### The perspective of service marketing[1]

Service marketing research acknowledges the relational nature of value creation and its occurrence in value networks

[1] This section was co-authored by Nancy V. Wünderlich, Jens Hogreve, Stefanie Paluch, Jan H. Schumann, and Jochen Wirtz.

(Vargo & Lusch, 2004). We briefly illustrate how this relates to the value and continuous dimensions of CVS and emphasize two particular service marketing fields with the potential to further advance the overarching CVS notion: S*ervice technology* enables platforms and digital markets, while *transformative service research* (TSR) promotes sustainable services and service inclusion.

### Service marketing and CVS principles

The central service marketing research concept of value co-creation ultimately targets the building and maintenance of long-term relationships with customers. In particular, this entails the inclusion of a broad set of customer values—including emerging customer emphasis on sustainability, inclusion, and well-being ("value-extending")—as well as creating and implementing new institutional arrangements such as performance-oriented contracts to secure the alignment of interests ("institutionalizing"). To this end, a diverse set of actors and resources have to be integrated within a service system to appropriately address customer value ("shaping"). The relational nature and the "value-in-use" focus of a service-dominant logic as well as the reaction to everchanging customer needs requires permanent exchange with customers ("interacting") as well as the frequent exploration and adaption of services over time ("experimenting").

### Service technology

**Platforms and digital markets** Digital platforms are prime examples for CVS, as they often utilize data-driven and experimental approaches to service innovation and address societal problems, such as the more efficient use of resources (mobility services, sharing, etc.). Whereas managing digital platforms is challenging, service marketing research adds value to the CVS of digital platforms in several ways. Based on role theory (Solomon et al., 1985), service marketers can help advance knowledge on how platforms can effectively manage actors—who can act as both customers and producers—and switch between the two roles. Additionally, service marketing researchers can build on and advance emerging research on digital customer orientation (Kopalle et al., 2020) to assist platform providers in managing relations with two or more customer populations in order to understand, prioritize, and integrate their respective needs in CVS efforts. This is particularly relevant for assessing and managing non-monetary value contributions from users on platforms with a "free" business model (Anderl et al., 2016; Kumar & Reinartz, 2016). Service marketers can also inform CVS research when studying the role of AI in shaping consumer behavior on platforms (Huang & Rust, 2021).

**Smart services along the customer journey** Smart service technologies in combination with intelligent automation (IA), are becoming more powerful and affordable (Bock et al., 2020; Bornet et al., 2021). These technologies enable customer journeys to be streamlined, simplified, and scaled. Information processing-type services will increasingly be fully automated without any human involvement. Fully automated services will likely become the norm for numerous information processing-type services—such as financial services, healthcare, and education—as the marginal costs will be negligible in many cases (Wirtz et al., 2022). Intelligent automation will dramatically change the customer journey, even for physical service processes. For example, future hair salons can utilize smart mirrors and AI to analyze a customer's hair and recommend different hairstyles. CVS research is needed to better understand the key value drivers of these customer journeys, which are likely to include the design, operation, and continuous improvement of frictionless customer journeys that are customer-error tolerant and also master automated service recovery when needed. While the economics of fully automated services will be unbeatable, their value creation capability must go beyond offering low or even free services to explore core services that are truly experiential in nature and require higher-level social and emotional skills for which human employees will be more expensive but preferred (Wirtz et al., 2018).

### Transformative service research

**Sustainable service** In today's world, creating or shaping value cannot be done without understanding the societal and environmental impact of a (digital) product or service (Luu, 2022; Moliner-Tena et al., 2023). Additionally, consumers' increasing awareness of these potential impacts motivates them to integrate "sustainability" into their decision-making processes (Hsiao et al., 2018). With this in mind, future CVS research might follow two routes: How services become more sustainable, and how services can support customers in becoming sustainable. Creating sustainable services entails a new manner of thinking about what sustainability requires and how this goal can be reached. It requires a transformation that affects not only the service delivery but also the value co-creation with customers. This involves achieving the target of net zero transmissions as well as implementing a sustainable value chain, sustainable leadership, and organization. By incorporating appropriate performance measurements, service marketers can effectively depict and communicate the success of such initiatives. CVS research should also identify innovative service business models that can assist companies or consumers in more sustainable behavior. Thus, a focus on CVS needs to be accompanied by innovative service designs that support customers in B2B and B2C services in becoming more sustainable.

**Service inclusion** Transformative service researchers strive to create positive changes and improvements in individuals' well-being by identifying and addressing unfairness in service systems (Anderson & Ostrom, 2015; Russell-Bennett et al., 2019). Unfairness can manifest in various ways, such as lack of access to services, systematic bias, customer vulnerability, or discrimination during service interactions and value co-creation (Wirtz et al., 2023). Recognizing the important role of service systems in human well-being, scholars call for research on service design that promotes inclusion and reduces consumer vulnerability (Finsterwalder et al., 2021; Wünderlich et al., 2020). Service inclusion refers to the accessibility and availability of a service or product to all members of a population, regardless of their individual characteristics or circumstances. CVS research opportunities include understanding how to use technology—such as artificial intelligence—to cocreate value and design services that enable equal opportunities in service contexts; how to facilitate value co-creation with customers without causing perceptions of stigma and vulnerability, and how to empower service customers to become co-designers of services that meet their needs (Fisk et al., 2018). As technology becomes increasingly prevalent in service provision (Larivière et al., 2017), CVS research should also explore the means required to establish digital inclusion, as a lack of it can cause societal-level inequalities in digital access, capabilities, and outcomes (Fisk et al., 2022).

Thus, we consider service marketing research that embraces all the principles of CVS as a boundary object for innovation. For the interdisciplinary discourse and advancement of innovation approaches, it offers concrete valuable components and future research endeavors, such as service technology with platforms to shape and institutionalize new ecosystems, smart services to nurture interaction and experimentation, and transformative service research that targets value-extensions to sustainability, fairness, and well-being dimensions.

## The perspective of information systems[2]

The information systems (IS) discipline focuses on "explaining and shaping the interplay between organizations, individuals, and information technology" (Schütte et al., 2022, p. 529). At the beginning of the new millennium, service science has become a popular topic in IS research. The focal phenomena investigated are designing new methods for (smart) service systems engineering (Böhmann et al., 2014), developing IT artifacts for enabling and facilitating service processes in networks (Becker et al., 2012) and on digital platforms, and exploring the role of IT artifacts for cocreating value propositions in (smart) service systems (Beverungen et al., 2019a, 2019b). In the following account, we show how IS research has linked to each of the five CVS principles and what kind of future contributions from IS to CVS development we may expect.

### Value-extending

Service research within the IS discipline has predominantly adopted the conceptualization of value-in-use, as posited by the service-dominant logic (SD-Logic) (Brust et al., 2017; Vargo & Lusch, 2008). In doing so, IS research remained compatible with other fields of service research, thereby providing potential for mutual understanding and interdisciplinary research. A special focus of future IS research is *service interaction through digital interfaces* to shape value-in-use via cocreation between human and "machine" actors (e.g., artificial intelligence agents). Additionally, while calls have been made for broadening the perspective on value, a multidimensional conceptualization of value remains the exception rather than the norm. On the level of *service ecosystems*, the environment, employees or society are modelled as actors who contribute their services toward joint value creation. The principles for the design of digital service platforms for such ecosystems have also begun to include personal well-being and social welfare (Michalke et al., 2022). The methods for the engineering of (smart) service systems could include activities to reduce (or eliminate) carbon footprints of the resulting service systems, provide better working conditions for service personnel, and become inclusive for customers who cannot offer superior customer lifetime value.

### Institutionalizing

The IS discipline has been built strongly on the establishment of a service system, initially coined as "[…] a configuration of people, technologies, and other resources that interact with other service systems to create mutual value" (Maglio et al., 2009, p. 395). Along these lines, IS research has invented an entire collection of methods to facilitate (smart) service systems engineering (Beverungen et al., 2019b; Böhmann et al., 2014) to design new value propositions along with the institutional embedding in which value is cocreated. In most publications, the actors implicitly assume the roles of service providers and/or service customers, thereby reflecting a dyadic level of value co-creation. However, IS research has also long investigated how networks of companies or communities of people cocreate services while using IS to communicate, cooperate, and coordinate their cocreation of value on a network level that extends beyond the dyad (e.g., Becker et al., 2013;

[2] This section was co-authored by Daniel Beverungen, Christoph Breidbach, Martin Gersch, Jens Pöppelbuss, and Susanne Robra-Bissantz.

Poeppelbuss et al., 2022). Beginning from the conceptualization of so-called hybrid value networks—including service companies and manufacturing companies (Becker et al., 2008)—this stream of research has since evolved to focus on *service ecosystems* that might include dozens, hundreds, or thousands of nested actors at different levels of system abstractions. Due to its interdisciplinary focus, fundamental theories used in IS explain how social systems evolve from people's actions and technology use. Simultaneously, they also consider how social systems shape organizations and IT artifacts. Fundamental theories that could be adapted to a service context include the structuration (Giddens, 1984), institutional (Alvesson & Spicer, 2019; Gegenhuber et al., 2022), systems (Luhmann, 1995), and task-technology fit theories (Goodhue & Thompson, 1995).

### Interacting

The IS discipline has long considered how digital technology facilitates online interactions. For example, smart service systems refer to service systems in which smart products—physical goods that are digitally networked—are used as boundary objects that provide local usefulness and shared identity to different actors that cocreate value (Beverungen et al., 2019b). Similarly, digital service systems build on IS as boundary objects with no physical properties to interact with. In both cases, IT has advanced online interactions beyond discrete service episodes (Beverungen et al., 2019b). Joint interaction spaces—which increasingly extend into service use—are a valuable source of data on service selection, preferences, and needs that enable ongoing service innovation. Such *smart or digital service systems*, with their specific perspective on underlying information systems, could enable IS research to further explore and design the multilateral relationships among people, organizations, regulation, and technology, thereby creating a complex and dynamic interplay.

### Experimenting

The ongoing nature of value co-creation has also led IS researchers to conceptualize service engineering as a continuous and iterative process. While most of the current methods for (smart) service systems engineering—for example, DIN SPEC 33453—prescribe the process as a transformation project that relies on activities such as (market) analysis, design of service systems, and transforming current service systems, first claims have been voiced to conduct service innovation "on-the-fly" in a manner that integrates with service provision (Beverungen et al., 2021). This stream of research relates to *methods for agile software development, design thinking, digital (autonomous) learning in service-interactions, or dev-ops approaches*, which favor designing prototypes and testing them in the field early over long-term innovation projects. To speed up the innovation process, service engineering has been conceptualized as a process of recombination (Beverungen et al., 2018), which involves designing new value propositions based on existing ones that are digital or have been liquefied by adding digital resources. Furthermore, the research paradigm of *design science research* in IS (Hevner et al., 2004) provides guidance for developing IT artifacts (including constructs, models, methods, and software instantiations; March & Smith, 1995) that can be utilized for experimental service innovation processes as well as for developing novel IT-enabled service delivery systems that become part of the service innovation outcome.

### Shaping

IT artifacts provide the opportunity to collect and analyze field data in a manner that informs (smart) service systems engineering, value co-creation, or new value propositions. However, beyond original notions of the words "engineering" and "design," moving toward the more open and less controllable level of a service ecosystem, it becomes evident that neither technology nor social structure can fully prescribe value cocreation. While dyadic relationships of one service provider with one service customer might be easier to design and control, ecosystems are characterized by a higher degree of complexity that reaches beyond the control exerted by any single actor. Thus, bringing a (smart) service system to flourish might resemble a metaphor of growing (or shaping) more than one of design or engineering in the sense of developing artifacts that address the requirements imposed on a service system. Complementing the digitally enabled approaches of open innovation and learning from co-creation data as well as service design and engineering, one approach to shaping will likely be to *interweave these service innovation options*—which to date have mostly been considered and executed separately—into an integrated approach. *Action design research* (Sein et al., 2011) might provide valuable guidelines to this end. The rise of more complex and less deterministic information sytems, including public dataspaces (Beverungen et al., 2022) or sophisticated chatbots, accentuates the need for research on the roles, prospects, and limitations of designing (smart) service systems that include digital technology.

In summary, we conclude that while the IS discipline is currently progressing along all five principles already, it may offer valuable research results and lead to the devotion of future endeavors to adjacent disciplines related to CVS. The themes center around shaping digital ecosystems and platforms, smart and digital service systems, agile and open innovation methods and their integration, as well as design science research.

## The perspective of (service) engineering[3]

Service engineering is a research stream and sub-discipline that concentrates on the systematic development and management of services using methods, models, and tools (Leimeister, 2020). It roots back to the mid-1990s and follows the logic of engineering disciplines in which methods, models, and tools structure the process of engineering new products. Service engineering—in contrast to service marketing related procedures such as in the research stream of new service development—focuses on leveraging the systematic fashion of methods, models, and tools to design innovative services. Initial work was aimed at providing procedures for introducing new services to the market from an initial idea through design and implementation. Almost without exception, the approaches generated followed a logic adopted from the development of physical products—that is, the idea generation phase was followed by the design phase and, finally, the implementation phase (Kim & Meiren, 2009). Although the holistic development of services has always been a feature of service engineering, services have increasingly been understood in research as complex socio-technical systems (Ravindran et al., 2018), which led to the further development of service engineering to service systems engineering (Böhmann et al., 2014). Thus, service engineering has made extensive contributions to CVS and has the potential to contribute to it in the future as well. The following paragraphs outline past and future contributions.

### CVS contributions of service engineering

In recent years, there have been interesting service engineering developments that have contributed to CVS and its principles: Due to the ever-increasing speed of changes from users, the customers and markets of today's VUCA world, concepts of design thinking and agile development have found their way into the world of service engineering. Services are continually elaborated and optimized by *continuous* repetition of essential process steps (Kreuzer & Aschbacher, 2014), including feedback loops from customers and other stakeholders in an *interacting* manner. Moreover, developments such as integrating human-centricity into *value-extending* service engineering approaches—which include methods, models, and tools that adopt the perspective of an explicit socio-technical system (Peters & Leimeister, 2013) or integrate several disciplines—have been observed and some of these have been discussed under the umbrella of advanced systems engineering (ASE).

### Future CVS contributions of service engineering

Service engineering might contribute to CVS in various ways: *Value-extension* might be realized by an ever-increasing number of attempts to design methods, models, and tools that enable service and service ecosystem design in a more sustainable manner or to enhance ecologically adequate service ecosystem designs (such as designs in the circular economy) (Fehrer et al., 2023). From a social sustainability perspective, human-centric service engineering approaches that embrace the trend of new technological capabilities that are leveraged bottom-up—such as low-code and no-code development platforms—and allow parts of the service (re-) design to be provided by a wider range of stakeholders might contribute again to *extending value*. Moreover, such service engineering approaches might contribute to CVS by *institutionalizing* the process of systematic service design in such difficult-to-manage bottom-up approaches that still require governance mechanisms to be effective.

The extension to an ecosystem and non-dyadic service development and provision perspective that is already prevalent in most current service engineering approaches will be further extended by a new type of *interacting* that is capable of strongly contributing to all aspects of future value creation and, correspondingly, to CVS: the interaction that all ecosystem stakeholders additionally have and integrate by creating value using generative AI agents. Service engineering can also contribute to the *experimenting* principle, as the necessities of becoming more agile and the possibilities of testing in the field rather than in the lab, will lead to methods, models, and tools of future service engineering that integrate the underlying agile, user-centered build-measure-learn cycles that will likely foster new service design and innovative means of service provision.

*Shaping*—by integrating value-extending and institutionalizing notions in service innovation with the interacting and experimenting approach afforded by digitalization—is also influenced by future service engineering. Future service engineering approaches could explicitly address, support, and enable the continuous improvement of services that are powered by state-of-the-art technology in a plug-and-play manner while having ecosystems stakeholders involved throughout the service life cycle that embrace an interactive and experiential method of service creation and improvement.

The challenges described above also lead to additional requirements for service engineers. On the one hand, the CVS team must encompass an overall broader spectrum of competencies. In addition to the development tasks described above, activities that previously tended to fall into the field of market research and product management must also be permanently integrated. On the other hand, the work in the CVS team also requires overarching

[3] This section was co-authored by Rainer Nägele, Christoph Peters, Thomas Meiren, Gerhard Gudergan, and Jan-Marco Leimeister.

competencies from each individual employee, such as, most importantly systems thinking, interdisciplinarity, agile working, and communication. Ultimately, an open corporate culture will be essential in order to consistently put CVS into practice.

Service engineering will contribute to CVS and its principles that will also require new organizational solutions, including changes in collaboration and corporate culture.

### Critical reflection

Intelligent service engineering means that "one-size-fits-all" approaches to services are not effective (Jaakkola et al., 2017). The range of services is ubiquitous. In particular, CVS will not make sense for services that are provided only once or that have a clearly defined end (e.g., the organization of a special event), at least in its entirety. CVS may also appear oversized for services that remain stable over a long period of time and barely change (e.g., due to legal regulations). However, for a large number of all other services, CVS represents a promising new approach and a valuable impetus for modern service engineering. Service engineering contributes to CVS and its underlying principles, which will—among others—lead to higher customization and user-centricity in a more efficient and sustainable manner, particularly through not only individualized, data-, and GenAI-based service engineering but also individualized, data-, and GenAI-based services offered and provided for users and customers.

## The perspective of the sociology of work[4]

The concept of CVS reflects the transformation of value creation. In our sociological research, we describe this as a change in the mode of innovation in companies and organizations toward "innovation in permanence" (Boes et al., 2019). The background to these considerations is provided by theoretically founded and empirically validated findings on the emergence of a new paradigm of conducting business, which manifests itself in a new pattern of value creation (Boes & Langes, 2019; Boes et al., 2019). This, in turn, involves a fundamental change in the mode of innovation (Boes & Langes, 2023) that is agile—*experimenting* and *interacting*. Based on our own research on digital innovation, we elaborate three contributions to the research concept of CVS in terms of the theoretical foundation, empirical findings, and aspects of transformation and design.

### Theoretical foundation

The theoretical foundation is the theory of informatization (Baukrowitz et al., 1996; Boes, 2005). From this perspective, digital transformation and the associated experience of a fundamental, disruptive change in the economy is based on a shift in the productive power structure of society. The rise and spread of the Internet in society has not only created a new worldwide technical infrastructure but also a globally available "information space" (Baukrowitz et al., 1996; Boes, 2005). As a new level of social action, this makes it possible to share information and knowledge at a new quality level, communicate and collaborate, and analyze and intervene for action in the material–physical world. In the 1990s, this development led to an economic exploitation of the Internet, primarily in Silicon Valley companies, which resulted in the creation of a new paradigm of business.

After the domination of the economy by the paradigm of "big industry" (Marx) for the last 150 years, a new dominant pattern of value creation has emerged with the paradigm of the "information economy" (Boes & Langes, 2019; Boes et al., 2019). In this paradigm, value creation is orchestrated in the information space, where essential elements required for this are available. Unlike in the past, the focus is no longer on materially determined products and processes but on data and information, which have become the starting point for value creation. This paradigm was initially seen primarily in Internet start-ups and cloud companies, which pioneered new ways of shaping value creation in the information space; however, it is currently diffusing into industrial cores and service sectors. Thus, after the industrial revolution, we are once again experiencing a historic paradigm shift in the economy.

What characterizes the information economy paradigm? We have been able to identify three principles: Value creation is conceived from information; the transformation of data into innovation acts as a driver of permanent innovation; and the information space is used as a holistic space of production. By bringing these principles together, a new pattern of innovation can be identified. The starting point and "raw material" of value creation is the data accumulating in the information space. This "raw material" is processed and "refined" by people in the work process: They transform data into meaningful information; answer the crucial question of what use values can be created with the data; and then transfer them into new or improved products, processes, or even entire business models, which in turn "produce" new data. The resulting "mode of permanent innovation" (Boes et al., 2019; Langes & Vogl, 2019) is based on a cycle of permanent learning. This becomes the inner momentum of value creation in the information economy.

The aspect of "value" addressed in the CVS concept is embedded in a specific understanding of the redesign of

[4] This section was co-authored by Andreas Boes and Barbara Langes.

value creation within the paradigm of the information economy. The focus is on the necessity of conceptualizing value creation in the information space and the associated mode of innovation, which is also described by the CVS principles (experimenting and interacting). Whether and in what form the paradigm shift in the economy will be socially and ecologically sustainable depends on the real empowerment of all stakeholders and the interests and values they bring into the value creation process (value extension). This also makes a permanent negotiation of new rules necessary, which, in turn, enables a true interactive interplay of the stakeholders (institutionalization).

### Empirical findings

In empirical analyses of the strategies of US and German pioneering companies from the information and communication technology (ICT) industry, the media sector, the automotive industry, mechanical engineering, the electrical engineering sector, and the mobility sector, we have been able to show how value creation is organized in the information economy paradigm and how innovation and work are changing (Boes & Langes, 2019, 2023; Boes et al., 2019).

The rise of the new paradigm of value creation initially affected the IT industry and individual consumer industries—such as music, film, or book retailing—and led to "disruptive" changes in markets (Winter, 2017). A key role was played by the cloud concept, which has experienced its breakthrough in the IT world since 2007/08 as "the next big thing" (Gartner, 2008; Hellige, 2012). This has created the basic infrastructure for exploiting the potential of the information space (Boes & Langes, 2019). For example, pioneers such as Salesforce, Amazon Web Services, and Google exemplify how value creation, innovation, and work are organized in the information economy. This basic principle is also making its way into industrial cores with the rise of the Internet of Things (IoT). Tesla is an impressive example of this.

Tesla is successful because it is able to operate industrial production in car manufacturing according to the principles of the information economy (Boes & Ziegler, 2021). The car becomes an object in the information space. Unlike traditional car manufacturers, Tesla's cars are not delivered to the customer as "dead" products, but are permanently innovated via continuous software updates via the Internet (over the air, OTA); thus, they are expanded in their functionality and become "living" products. To put it bluntly, Tesla builds cars in the same manner that Internet companies today make cloud-based software available to their customers. The mass of data enables the company to obtain and analyze information regarding the use of the car at a completely new quality level. The company uses these insights to make improvements to the product, the production process, or even the business model as a whole in *interactive* learning loops. Tesla even explores new value propositions through *experimentation* within a constantly evolving and negotiated *institutional* framework (e.g., for autonomous driving). This is why Tesla is now far superior to its competitors when it comes to crucial innovations, such as autonomous driving or battery control, particularly with regard to the learning curve for innovations.

In turn, this mode of innovating requires new concepts of work organization. In particular, agility is proving to be a strategic concept for a new organization of innovation. Thus, agile principles become the catalyst for the operating system of a new culture of work.

### Transformation and design

Managing the paradigm shift is a mammoth task for business and society, which have been developing for decades in the paradigm of big industry. Companies must first understand the new paradigm, develop new value creation concepts, and then implement them against the backdrop of historically evolved social relationships. Precisely because the paradigm shift involves a complex transformation of the organization, classic change models are not sufficient. Rather, new approaches are required that place the strategic processing of the paradigm shift at the center and build living innovation cultures from the bottom-up.

Our concepts and methods are characterized by the following three principles: First, they are aligned to a clear target point—managing the paradigm shift in organizations, from the innovation of business models to the realignment of value creation relationships, to the transformation of work and competencies. Second, they rely on consistent empowerment of the stakeholders involved, which goes far beyond a "Potemkin participation" only tailored to secure acceptance. Innovations are developed from the bottom-up. Third, we pursue an agile and experimental approach. We have developed different variants as concrete implementation: the company practice laboratory (Boes et al., 2017) has been conceptualized to break new ground in the design of work in an agile and participatory manner in social partnership within the companies. This laboratory can be understood as a framework under permanent modification that permits the actual participation of all stakeholders. We have transferred this concept to the participatory development of AI (Langes et al., 2023) in the context of service research in cooperation with colleagues from IS research.[5] While these approaches focus on the implementation of innovations in the project context, with the hub "Shaping Innovations Sustainably" (Langes et al., 2023), we have created a reference

[5] Project HISS (Hybrid Intelligence Service Support). Online: https://projekt-hiss.de/das-projekt/.

example how a cross-network hub in service research can succeed along these principles. Thus, through a bottom-up culture of innovation, we have succeeded in building a lively community.

## The perspective of innovation management[6]

The objective of innovation management (IM) is to create individual, organizational, and systemic capabilities that enhance the performance of innovation activities (Hauschildt et al., 2022). Accordingly, IM is defined as the conscious design of the innovation system—that is, not only of individual processes, but also of the institution within which these processes take place (Schultz et al., 2013) – a concept very similar to service systems formed to drive joint value generation in general. Digital technologies have fundamentally been changing the playing field of IM. Increased connectivity (Kroh et al., 2018) drives the emergence of multi-layered architectures up to digital platform-based services (Hilbolling et al., 2020). As traditional IM practices may not be sufficient to navigate the new digital innovation terrain (Rindfleisch et al., 2017), a different set of capabilities for success is required (Dąbrowska et al., 2022).

In the following account, we show how IM research is connected to each of the five CVS principles and what future contributions to CVS we can expect from IM.

### Value-extending

IM has increasingly begun to address the requirements of greater sustainability and, thus, a more comprehensive understanding of value enhancement as an objective of innovation processes. The concept of "responsible innovation" is becoming increasingly important and leads to the analyses and design of innovation processes by broadly considering the consequences of innovation (Voegtlin et al., 2022). This concept applies the AIRR scheme (Owen et al., 2013), calling for the anticipation (A) of potential and realized intended and, most importantly, unintended effects of innovation; inclusion (I) of heterogeneous stakeholders; reflection (R) of different interests (with new incentives, management approaches, communication tools, and cultural change); and embedded responsiveness (R) in order to target the ability to change and the agility of employees and political actors.

### Institutionalizing

One of the fundamentals of IM is the design of the innovation system and, thus, of the institutional framework for the interaction of all actors involved in the innovation process. In the context of the CVS concept, this refers to both the design within the organization and that in its environment. Some important aspects in this regard include the concept of organizational ambidexterity to enable both the utilization of existing resources and to explore new resources alike (March, 1991); the analysis of leadership-promoting innovation performance, such as visionary leadership (Van Knippenberg & Stam, 2014); as well as suitable incentive systems for coping with the greater uncertainty and complexity in the innovation process (Garrelfs et al., 2023). Recently, more focus has been devoted to "innovation ecosystems" and, in particular, the phenomenon of open innovation (Chesbrough et al., 2018), including the exploitation of the potential of corporate collaborations (Walter et al., 2015), university–industry collaborations (Melnychuk et al., 2021), user communities (Jeppesen & Frederiksen, 2006), and the management of innovation ecosystems (Lütjen et al., 2019). In light of the CVS concept, even stronger focus may be placed on heterogeneous stakeholder groups as well as the political environment (Kroh & Schultz, 2023) and their evolutionary processes (Schweitzer et al., 2024).

### Interacting

From the perspective of IM, this CVS principle reflects itself in dynamic episodes of incremental innovations and in the involvement of internal and external stakeholders in the innovation process. Continuous improvement of services leads to learning curve effects and, thus, to correlations of quality and efficiency with experience, which can be observed in numerous service industries. Similarly, IM also deals with the risk of lock-in effects resulting from continuous improvement as well as path dependencies (Schreyögg & Sydow, 2011). As AI-based innovations, in particular, lead to a disruption of hierarchies and divisions of tasks of service providers (e.g., in healthcare; Ackerhans et al., 2024), these disruptive processes have also become an important subject of innovation research more recently (Garrelfs et al., 2023). This also includes the integration of more skeptical stakeholders through new forms of participation to increase acceptance and initiate an interactive process of mutual adaptation of innovation goals, innovation content, and institutional framework conditions (Kroh & Schultz, 2023).

### Experimenting

The CVS concept aligns with IM efforts to expand the range of methods and instruments and to promote a cultural context that favors experimentation and tolerates failure. IM methods calling for experimentation follow the idea of increasing agility in the innovation process. Traditionally formalized innovation processes are broken up by iterative

[6] This section was co-authored by Carsten Schultz.

elements, and prototypes are tested quickly and at an early stage with the involvement of the users (Cooper & Sommer, 2018). In addition, IM is also increasingly becoming concerned with the possibilities of data-based simulation of innovation results, which are facilitated in the course of current developments in AI. However, these agile processes must be embedded in an environment that fosters experimentation. However, service providers and their employees are often particularly risk-averse (as failures negatively impact service delivery quality); moreover, functional silos prevent interdisciplinary and boundary-spanning approaches (Schultz et al., 2019) and active participation of frontline employees in empirical hypothesis testing remains rare. In general, the cultural setups typically cement the status quo (Garrelfs et al., 2023) rather than enable experimentation. Therefore, a special contribution of IM research to CVS resides in the design of such cultural framework conditions.

#### Shaping

The consequence of responsible, value-extending, as well as ecosystem-based and highly active innovation processes require approaches beyond the scope of individual enterprises. Simultaneously, the source of competitive advantage is no longer historical resources but dynamic capabilities for continuous transformation of a firm's resource base. Thus, IM needs to extend the concept of dynamic capabilities from individual organizations to open ecosystems of service providers, customers, and other actors who contribute directly and indirectly to value creation (Lütjen et al., 2019). IM research can make an important contribution to the CVS concept through its anchoring in organizational and diffusion theories and the provision of suitable empirical methods for researching causal relationships.

In summary, we conclude that while the IM discipline is currently already closely linked to all five principles, it may catalyze the future development of CVS and also contribute research results to adjacent communities. New IM-driven themes center around responsible "AIRR"-schemed innovation, open innovation and innovation trajectories, disruptive phenomena, agile-friendly innovation methods and company culture, as well as dynamic capabilities of ecosystems.

## Discussion

The preceding individual perspectives demonstrate that CVS is a concept for service innovation that addresses current transformative developments in business and society and can serve as a boundary concept that connects various disciplines, thereby enabling them to unite research efforts on service innovation. In the following, we discuss the two intended contributions of the CVS concept: First, it should forge fruitful connections of so far disconnected streams of research on service innovation and catalyze the work on a number of emerging research streams. Second, it should lead to an integrated re-thinking of service innovation approaches for complex new challenges—which we will illustrate in the context of the imminent "twin transformation" (Christmann et al., 2024) of digitalization and sustainability.

### CVS as an enabler for cooperation across different disciplines

Analyzing and synthesizing the individual perspectives in the previous section, we find that, first, the CVS principles are well reflected in the topics covered by the disciplines albeit embedded in various endeavors, and, second, that current research topics connect around certain service innovation themes. As a consequence, the CVS principles may provide the boundary concept to draw on existing research in adjacent disciplines and to enable cooperation and cross-fertilization across the disciplines.

In all disciplines, research connects well to the five principles of CVS, while the terms or focuses used in each certainly differ. The v*alue-extending* principle, e.g., is reflected in responsible innovation in innovation management, in human-centric approaches in service engineering, or in transformative service research advanced by service marketing research. The *interacting* principle is inherent particularly to themes around smart services enabling continuous provider-customer exchange, e.g., in the redesign of customers' journeys (service marketing, service engineering), in learning from data on customer service usage (information systems), or in barriers to recognize disruptive technologies (innovation management). Similarly, the *experimenting* nature of innovation manifests in "permanent" innovation within continuous learning loops (sociology); the development of open and agile innovation methods (service engineering, innovation management), or new options for recombination and prototyping, particularly in digital services (information systems). When it comes to the *institutionalizing* perspective on service innovation, the different fields first and foremost focus on the fundamental transformation of norms, rules, and values associated with new, agile, data-driven modes of working in creating digital innovation: Sociologists call it "… the operating system for a new culture of work," (p. 17), service engineers envision a "… CVS team [to] encompass an overall broader spectrum of competencies" (p. 14) that innovation researchers consider part of ambidextrous organizations capable of enabling such work environments. Finally, the disciplines also recognize the *shaping* principle indicating that service innovation is increasingly happening in "…ecosystems […] characterized by a higher degree of complexity that reaches beyond the control exerted by any single actor" (information systems)

**Table 1** Disciplinary research topics and interdisciplinary research themes related to CVS

| Discipline | Disciplinary research topics | Service innovation research themes | | | |
|---|---|---|---|---|---|
| | | DEP | SMS | TSR | OAM |
| Service marketing | Service technology with platforms to shape and institutionalize new ecosystems | X | | | |
| | Smart services to nurture interaction and experimentation | | X | | |
| | Transformative service research targeting value extension towards sustainability, fairness, well-being | | | X | |
| Information systems | Digital ecoystems and platforms | X | | | |
| | Smart and digital service systems | | X | | |
| | Agile and open innovation methods and their integration | | | | X |
| | Design Science Research | | | | X |
| Service engineering | Service ecosystem design | X | | | |
| | Human-centric service engineering approaches (new technological capabilities—such as low-code and no-code development platforms) | | | | X |
| | Data and genAI-based service engineering | | | | X |
| Sociology of Work | Paradigm-shift to data-driven and continuous innovation | X | X | | X |
| | Transformation and design | | | | X |
| Innovation management | "AIRR"-schemed innovation | | | X | |
| | Open Innovation | X | | | X |
| | Innovation ecosystems | X | | | |
| | Path dependencies and disruptive processes | | | | X |
| | Agile innovation methods and and experimentation-friendly culture | | | | X |
| | Dynamic capabilities of ecosystems | | | | X |

*DEP* digital ecosystems and platforms, *SMS* smart services, *TSR* transformative service research, *OAM* open and agile methods

(p. 13), mirrored by innovation management researchers who focus on the resulting strategic role of dynamic capabilities. The ongoing and unfinished state of innovation that sociologists emphasize also calls for a responsive and probing approach to innovation that is reflected in the shaping principle. This reiterates the notion of offerings that undergo a process of permanent iteration and improvement.

A qualitative analysis of the future research topics in each discipline reveals four overarching service innovation research themes: digital ecosystems and platforms, smart

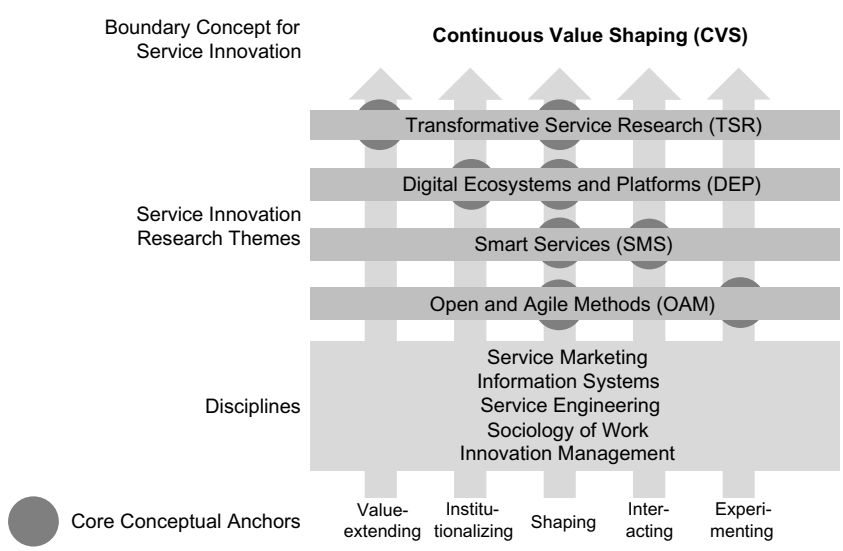


**Fig. 2** Emerging themes of continuous value shaping

services, transformative service research, and open and agile methods (as summarized in Table 1). These boundary-spanning themes can facilitate meaningful cross-disciplinary dialog and interdisciplinary research on service innovation. Each of these themes has a conceptual anchor in one of the CVS principles, but effectively links into all of them (cf. Figure 2):

*Smart services* change interactions, but also benefit from institutionalized standards, enable experimental approaches, and facilitate novel value propositions with human or societal values. *Open and agile methods* are closely linked to the experimenting principle but are based on an interactive mode of innovation that can help organizations to learn about effective ways of extending their value propositions. Institutionalized routines and regulations may have to change to allow for such an approach to service innovation. *Digital ecosystems and platforms* require shared norms and rules, but are likely built in an iterative and experimental fashion. Certain value-extending service innovations may only be achievable within an ecosystem of actors. Finally, *transformative service research* puts value-extension front and center. However, effective innovations may require extensive interactive learning, experimentation, and support from regulation and changing norms. Across all these themes, innovation unfolds as a result of an iterative process of shaping that leverages digital capabilities of interactive learning and experimenting to probe effective approaches as well as institutional safeguards for human and societal impact.

In sum, the CVS perspective offers a fruitful boundary concept for trans- and interdisciplinary research. The principles should help direct new endeavors to advance service innovation and enable learning from adjacent disciplines. Potentially even more importantly, the boundary concept could support the linkage of empirical or design-oriented research outcomes from different disciplines and, thus, provide a coherent framework for the interdisciplinary integration of knowledge on service innovation. Ultimately, the principles should serve as a vantage point for developing new methods or method improvements to drive concrete service innovations for the betterment of individuals, businesses, and society. To link to our introductory analogy with software-defined vehicles: the individual IT-controllers could now draw on the information provided by each other, and their compatibility and connection may allow for completely new use cases.

It should be noted that novel approaches may not just be catalyzed by interdisciplinary research, but also afford the opportunity to learn from and through the transformation of service innovation in practice. As the principles depart from traditional service innovation approaches, organizations need to adapt to the innovation-in-use mindset embodied in CVS. As a boundary concept, the CVS perspective enables interdisciplinary collaboration to engage researchers and practitioners alike in transformation-focused research on service innovation.

Certain disciplines pursue action-oriented or design-oriented research approaches. Information systems researchers have proposed the action design research (ADR) method to develop new knowledge through the process of engaging organizations and practitioners. ADR builds on design science research but combines this approach with action research, which proposes the active engagement of researchers within organizations. Similarly, researchers in the sociology of work have proposed company practice laboratories as conduits for engaging in transformative processes in industry. This similarity in research approaches provides a platform for multidisciplinary interventions to support organizational transformation. Such design-oriented work has recently been adopted in other disciplines, too (Hunke et al., 2024; Teixeira et al., 2017, 2019). The principles of CVS could help create an interdisciplinary research program focused on learning through actively engaging in the transformation of service innovation.

## CVS as an integrated framework for new service innovation challenges—The case of the twin transformation

Over and above connecting so-far disconnected streams of research, CVS presents an opportunity for a more integrated interdisciplinary approach for service innovation. In our analogy with software-defined vehicles, this would mean that the development process could be completely redefined "Tesla-like" if thinking is now based on the central IT backbone as the new framework. We will illustrate the power of such an integrated approach for driving innovation in the context of the twin transformation of sustainability and digitalization (Christmann et al., 2024). The notion of a twin transformation calls to address trade-offs and to seek synergies between these two transformational processes in our societies, and CVS as a new conceptual framework should help to advance service innovation in this contemporary context.

CVS can serve as such a framework firstly because it is reflecting changes to service innovation rooted in digitalization. This is evident in numerous of the disciplinary arguments. Sociologists indicate the paradigm change prompted by digitalization, thus rendering traditional approaches to innovation ineffective. Marketing researchers state that smart services and platforms are key conduits for experimental, data-driven approaches to innovation and for transforming customer journeys. Researchers in information systems and service engineering emphasize how agile approaches and new forms of developing digital services, such as agile software development and DevOps, enable an ongoing

and experimental approach to innovation and help shape advanced solutions. Thus, CVS establishes a joint concept for service innovation that builds on and integrates digitally enabled approaches to service innovation that are aligned with smart systems and digital platforms built on capabilities of human and artificial intelligence (Roth et al., 2024) and that are powered by data and software.

The second reason for the value of CVS as a framework to advance service innovation is that the disciplinary arguments reveal the role of values-aware innovation, which seeks to address the grand challenge of sustainability. This is particularly prevalent in the arguments of the marketing and innovation management communities. Both address the notion of responsible innovation leading to more sustainable ways of economic and social activity. For marketing researchers, this translates into a dual goal for innovation: to make service more sustainable and to leverage service innovation to support customers in sustainable behavior. Both communities also propose an emphasis on inclusiveness. These arguments underline that new service innovation approaches should focus on values beyond the immediate business impact as well as provide support for identifying and systematically addressing such a broader set of values.

We argue that the CVS perspective affords the opportunity to more effectively integrate these two streams to establish an integrated framework for service innovation in the context of twin transformation. Digitalization enables a more interactive and experimental approach to innovation, with data-driven learning regarding effective behavior of customers and providers. This could be key in a step-by-step process of establishing sustainable service innovation that builds on changed customer behavior. For this value-oriented approach, service innovation needs to be guided by measurable objectives that reflect desired sustainability goals (Heinz et al., 2023). When taking this development one step further, service innovations that become effective when supported by multiple actors in an ecosystem could require institutional developments that allow for the sharing of data or models across actors (Fassnacht et al., 2023; Heinz et al., 2022b). It is known that such digital infrastructures can only be established in an interactive process of development over time (Eriksson & Öhlund, 2024). On the flip side, service innovation that focuses on sustainability goals can be a driver for more digital innovation. This is, for example, evident in the smart home space where the digitalization of energy networks facilitates decentralized and renewable energy supply (Badar & Anvari-Moghaddam, 2022; Paukstadt & Becker, 2021). Such developments can provide the rationale for the institutional changes that are required to develop smart and data-driven services (Töytäri et al., 2017).

We may highlight the central role of the shaping principle in this general integrating CVS framework as it not only serves to connect the principles, but also adds the focus on learning through interventions: In the case of twin transformation, sustainable service innovation is likely to emerge through a longer process of innovation-in-use. Such a process allows gradually "shaping" value-oriented service and supporting institutions over a series of exploratory and learning-oriented interventions. The principle of shaping builds on digital capabilities of learning in use to forge a path towards effective service innovation and moves beyond (service) engineering processes to service innovation. Shaping also goes further than agile approaches that typically do not account for processes of institutionalization. Thus, the shaping principle calls for service innovation research to conceive processes that integrate digital, behavioral, and normative developments within an overarching framework of ideation and evaluating step-wise intervention towards economic and social value.

## Conclusion

This paper introduces CVS as a contemporary and interdisciplinary boundary concept of service innovation. CVS addresses the paradigmatic changes related to value propositions and to the effects of digitalization. It envisions service innovation in the *value* dimension as *value-extending* and as effected through *institutionalizing* to achieve acceptable and desirable outcomes in multistakeholder settings. Moreover, CVS considers service innovation along a *continuous* dimension, which indicates that it is a permanent process of innovation digesting both environmental changes as well as learning during agile, cyclical, and experimental processes. This is expressed through the principles of *interacting* and *experimenting* innovation. This leads to the pivotal principle of *shaping* that designates the shift from linear service design and engineering toward repeated experimentation in open and dynamic service ecosystems.

Overall, this new perspective on service innovation is intended to be a boundary concept that can stimulate a cross-disciplinary debate on understanding and designing service innovation across research fields, such as service marketing, information systems, service engineering, sociology of work, and innovation management.

We demonstrate how emerging research themes may benefit from cooperation between the disciplines, and we illustrate how the CVS concept may serve as an integrated framework for re-thinking service innovation when tackling new complex tasks like shaping the twin transformation of digitalization and sustainability. Both contributions of the CVS concept should support researchers and practitioners to identify new ways to developing novel and competitive services.

**Funding** Open Access funding enabled and organized by Projekt DEAL. The authors acknowledge the funding of the German Ministry of Education and Research through the research project "DL2030" under the grant references 02K18D200 (Tilo Böhmann, Christian Kurtz, Tom Lewandowski), and 02K18D201 (Gerhard Satzger, Carina Benz), 02K18D202 (Angela Roth).

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## References

Ackerhans, S., Huynh, T., Kaiser, C., & Schultz, C. (2024). Exploring the role of professional identity in the implementation of clinical decision support systems—A narrative review. *Implementation Science, 19*(1), 11. https://doi.org/10.1186/s13012-024-01339-x

Alvesson, M., & Spicer, A. (2019). Neo-institutional theory and organization studies: A mid-life crisis? *Organization Studies, 40*(2), 199–218. https://doi.org/10.1177/0170840618772610

Anderl, E., März, A., & Schumann, J. H. (2016). Nonmonetary customer value contributions in free e-services. *Journal of Strategic Marketing, 24*(3–4), 175–189. https://doi.org/10.1080/0965254X.2015.1095219

Anderson, L., & Ostrom, A. L. (2015). Transformative service research: Advancing our knowledge about service and well-being. *Journal of Service Research, 18*(3), 243–249. https://doi.org/10.1177/1094670515591 31

Anderson, L., Ostrom, A. L., Corus, C., Fisk, R. P., Gallan, A. S., Giraldo, M., Mende, M., Mulder, M., Rayburn, S. W., & Rosenbaum, M. S. (2013). Transformative service research: An agenda for the future. *Journal of Business Research, 66*(8), 1203–1210. https://doi.org/10.1016/j.jbusres.2012.08.013

Antons, D., & Breidbach, C. F. (2018). Big data, big insights? Advancing service innovation and design with machine learning. *Journal of Service Research, 21*(1), 17–39. https://doi.org/10.1177/1094670517738373

Badar, A. Q. H., & Anvari-Moghaddam, A. (2022). Smart home energy management system—A review. *Advances in Building Energy Research, 16*(1), 118–143. https://doi.org/10.1080/17512549.2020.1806925

Baukrowitz, A., Boes, A., & Schmiede, R. (1996). Arbeit in der „Informationsgesellschaft". Einige Überlegungen aus einer (fast schon) ungewohnten Perspektive. In S. Rudi (Ed.), *Virtuelle Arbeitswelten – Arbeit, Produktion und Subjekt in der „Informationsgesellschaft"* (pp. 129–158). Sigma, Berlin.

Becker, J., Beverungen, D., Knackstedt, R., Matzner, M., Müller, O., & Pöppelbuß, J. (2012). Bridging the gap between manufacturing and service through IT-based boundary objects. *IEEE Transactions on Engineering Management, 60*(3), 468–482. https://doi.org/10.1109/TEM.2012.2214770

Becker, J., Beverungen, D., & Knackstedt, R. (2008). Wertschöpfungsnetzwerke von Produzenten und Dienstleistern als Option zur Organisation der Erstellung hybrider Leistungsbündel. In J. Becker, R. Knackstedt, & D. Pfeiffer (Eds.), *Wertschöpfungsnetzwerke: Konzepte für das Netzwerkmanagement und Potenziale aktueller Informationstechnologien* (pp. 3–31). Physica-Verlag. https://doi.org/10.1007/978-3-7908-2056-0_1

Becker, J., Beverungen, D., Knackstedt, R., Matzner, M., Müller, O., & Pöppelbuß, J. (2013). Designing interaction routines in service networks: a modularity and social construction-based approach. *Scandinavian Journal of Information Systems*, *25*(1), 2. https://aisel.aisnet.org/sjis/vol25/iss1/2

Beverungen, D., Lüttenberg, H., & Wolf, V. (2018). Recombinant service systems engineering. *Business & Information Systems Engineering, 60*, 377–391. https://doi.org/10.1007/s12599-018-0526-4

Beverungen, D., Breidbach, C. F., Poeppelbuss, J., & Tuunainen, V. K. (2019a). Smart service systems: An interdisciplinary perspective. *Information Systems Journal, 29*(6), 1201–1206. https://doi.org/10.1111/isj.12275

Beverungen, D., Müller, O., Matzner, M., Mendling, J., & Vom Brocke, J. (2019b). Conceptualizing smart service systems. *Electronic Markets, 29*(1), 7–18. https://doi.org/10.1007/s12525-017-0270-5

Beverungen, D., Hess, T., Köster, A., & Lehrer, C. (2022). From private digital platforms to public data spaces: Implications for the digital transformation. *Electronic Markets, 32*(2), 493–501. https://doi.org/10.1007/s12525-022-00553-z

Beverungen, D., Wolf, V., Bartelheimer, C., & Franke, A. (2021). Digitale Transformation von Dienstleistungssystemen–Beidhändige Innovationen für vernetzte Wertschöpfungsszenarien. In D. Beverungen, J. H. Schumann, V. Stich, & G. Strina (Eds.), *Dienstleistungsinnovationen durch Digitalisierung: Band 2: Prozesse–Transformation–Wertschöpfungsnetzwerke* (pp. 3–41). Springer Gabler. https://doi.org/10.1007/978-3-662-63099-0_1

Bock, D. E., Wolter, J. S., & Ferrell, O. C. (2020). Artificial intelligence: Disrupting what we know about services. *Journal of Services Marketing, 34*(3), 317–334. https://doi.org/10.1108/JSM-01-2019-0047

Boes, A., & Ziegler, A. (2021). *Umbruch in der Automobilindustrie*. ISF München.

Boes, A., Langes, B., & Vogl, E. (2019). Die Cloud als Wegbereiter des Paradigmenwechsels zur Informationsökonomie. In A. Boes & B. Langes (Eds.), *Die Cloud und der digitale Umbruch in Wirtschaft und Arbeit: Strategien, Best Practices und Gestaltungsimpulse* (pp. 115–147). Haufe.

Boes, A., & Langes, B. (2019). Einleitung. Mit der Cloud nimmt der digitale Umbruch an Fahrt auf. In A. Boes & B. Langes (Eds.), *Die Cloud und der digitale Umbruch in Wirtschaft und Arbeit: Strategien, Best Practices und Gestaltungsimpulse* (pp. 13–25). Haufe-Lexware.

Boes, A., & Langes, B. (2023). Innovation im Paradigmenwechsel. Überlegungen zur Neuausrichtung des Innovationssystems. In A. Botthof, J. Edler, K. Hahn, H. Hirsch-Kreinsen, M. Weber, & J. Wessels (Eds.), *Transformative und agile Innovationssysteme. Neue Praktiken und innovationspolitische Herausforderungen*. Campus Verlag.

Boes, A., Bultemeier, A., Kämpf, T., Lühr, T., Marrs, K., & Ziegler, A. (2017). Neuland gestalten. Das Konzept der betrieblichen Praxislaboratorien. In *Bundesministerium für Arbeit und Soziales, Arbeiten 4.0, Werkheft 03* (Vol. 3, pp. 154–162). Bundesministerium für Arbeit und Soziales.

Boes, A. (2005). Informatisierung. In Soziologisches Forschungsinstitut (SOFI), Institut für Arbeitsmarkt- und Berufsforschung (IAB), Institut für sozialwissenschaftliche Forschung (ISF), & Internationales Institut für empirische Sozialökonomie (INIFES) (Eds.), *Berichterstattung zur sozioökonomischen Entwicklung in Deutschland: Arbeit und Lebensweisen* (pp. 211–244). VS Verlag für Sozialwissenschaften.

Böhmann, T., Leimeister, J. M., & Möslein, K. (2014). Service systems engineering. *Business & Information Systems Engineering, 6*(2), 73–79. https://doi.org/10.1007/s12599-014-0314-8

Bornet, P., Barkin, I., spsampsps Wirtz, J. (2021). Intelligent automation: Welcome to the world of hyperautomation: Learn how to harness artificial intelligence to boost business spsampsps make our world more human. https://doi.org/10.1142/9789811235849_0001

Breidbach, C. F., & Tana, S. (2021). Betting on Bitcoin: How social collectives shape cryptocurrency markets. *Journal of Business Research, 122*, 311–320. https://doi.org/10.1016/j.jbusres.2020.09.017

Brust, L., Breidbach, C. F., Antons, D., & Salge, T.-O. (2017). Service-dominant logic and information systems research: A review and analysis using topic modeling. *International Conference on Information Systems (ICIS)*, Seoul.

Buiten, M. C. (2019). Towards intelligent regulation of artificial intelligence. *European Journal of Risk Regulation, 10*(1), 41–59. https://doi.org/10.1017/err.2019.8

Chesbrough, H., Lettl, C., & Ritter, T. (2018). Value creation and value capture in open innovation. *Journal of Product Innovation Management, 35*(6), 930–938. https://doi.org/10.1111/jpim.12471

Christmann, A.-S., Crome, C., Graf-Drasch, V., Oberländer, A. M., & Schmidt, L. (2024). The twin transformation butterfly. *Business & Information Systems Engineering*. https://doi.org/10.1007/s12599-023-00847-2

European Commission. (2023). *A European strategy for data*. Available at https://digital-strategy.ec.europa.eu/en/policies/strategy-data. Accessed 10 Mar 2025.

Cooper, R. G., & Sommer, A. F. (2018). Agile–stage-gate for manufacturers: Changing the way new products are developed integrating agile project management methods into a stage-gate system offers both opportunities and challenges. *Research-Technology Management, 61*(2), 17–26.

Dąbrowska, J., Almpanopoulou, A., Brem, A., Chesbrough, H., Cucino, V., Di Minin, A., Giones, F., Hakala, H., Marullo, C., & Mention, A. L. (2022). Digital transformation, for better or worse: A critical multi-level research agenda. *R&D Management, 52*(5), 930–954. https://doi.org/10.1111/radm.12531

Engels, A., & Marotzke, J. (2023). Assessing the plausibility of climate futures. *Environmental Research Letters, 18*, 01106.

Eriksson, O., & Öhlund, S.-E. (2024). Digital institutionalization: The case of e-prescribing. *Journal of the Association for Information Systems, 25*(3), 569–593. https://doi.org/10.17705/1jais.00845

Fassnacht, M. K., Benz, C., Heinz, D., Leimstoll, J., & Satzger, G. (2023). Barriers to data sharing among private sector organizations. *Hawaii International Conference on Systems Sciences (HICSS-56).*

Fehrer, J. A., Kemper, J. A., & Baker, J. J. (2023). Shaping circular service ecosystems. *Journal of Service Research*. https://doi.org/10.1177/10946705231188670

Finsterwalder, J., Kabadayi, S., Fisk, R. P., & Boenigk, S. (2021). Creating hospitable service systems for refugees during a pandemic: Leveraging resources for service inclusion. *Journal of Service Theory and Practice, 31*(2), 247–263. https://doi.org/10.1108/JSTP-07-2020-0175

Fisk, R. P., Dean, A. M., Alkire, L., Joubert, A., Previte, J., Robertson, N., & Rosenbaum, M. S. (2018). Design for service inclusion: Creating inclusive service systems by 2050. *Journal of Service Management, 29*(5), 834–858. https://doi.org/10.1108/JOSM-05-2018-0121

Fisk, R. P., Gallan, A. S., Joubert, A. M., Beekhuyzen, J., Cheung, L., & Russell-Bennett, R. (2022). Healing the digital divide with digital inclusion: Enabling human capabilities. *Journal of Service Research*. https://doi.org/10.1177/10946705221140148

Gal, U., Lyytinen, K., & Yoo, Y. (2008). The dynamics of IT boundary objects, information infrastructures, and organisational identities: The introduction of 3D modelling technologies into the architecture, engineering, and construction industry. *European Journal of Information Systems, 17*(3), 290–304. https://doi.org/10.1057/ejis.2008.13

Garrelfs, C., Schultz, C., & Luengen, M. (2023). Employee acceptance of disruptive service innovations at the frontline: The role of collective sensemaking processes. *Creativity and Innovation Management, 32*(3), 388–406. https://doi.org/10.1111/caim.12563

Gartner. (2008). *Hype cycle for emerging technologies, 2008*. Available at https://www.gartner.com/en/documents/717415. Accessed 10 Mar 2025.

Gegenhuber, T., Logue, D., Hinings, C. B., spsampsps Barrett, M. (2022). Institutional perspectives on digital transformation. In *Digital transformation and institutional theory* (Vol. 83, pp. 1–32). Emerald Publishing Limited. https://doi.org/10.1108/S0733-558X20220000083001

Giddens, A. (1984). The constitution of society. Cambridge. *Polity*, *284*.

Goodhue, D. L., & Thompson, R. L. (1995). Task-technology fit and individual performance. *MIS Quarterly, 19*(2), 213–236. https://doi.org/10.2307/249689

Hauschildt, J., Salomo, S., Kock, A., & Schultz, C. (2022). *Innovationsmanagement* (7 ed., Vol. 7). Vahlen.

Heinz, D., Benz, C., Bode, J., Hunke, F., & Satzger, G. (2022a). Exploring the potential of smart service systems: A multi-actor view on affordances and their actualization. *SMR-Journal of Service Management Research, 6*(2), 132–146. https://doi.org/10.5771/2511-8676-2022-2-132

Heinz, D., Benz, C., Fassnacht, M. K., & Satzger, G. (2022b). Past, present, and future of data ecosystems research: A systematic literature review. *Pacific Asia Conference on Information Systems, PACIS 2022, 5th-9th July 2022: Proceedings.*

Heinz, D., Breidbach, C., Benz, C., & Satzger, G. (2022c). Towards explaining smart service innovation events and trajectories. *International Conference on Information Systems (ICIS)*, Copenhagen.

Heinz, D., Hu, M., Benz, C., & Satzger, G. (2023). Digital service innovation for sustainable development: A systematic literature review. *International Conference on Wirtschaftsinformatik (WI)*, Paderborn.

Hellige, H. D. (2012). Cloud computing versus crowd computing: Die Gegenrevolution in der IT-Welt und ihre Mystifikation in der Cloud. Bremen.

Hevner, A. R., March, S. T., Park, J., & Ram, S. (2004). Design science in information systems research. *Management Information Systems Quarterly (MISQ), 28*(1), 75–105.

Hilbolling, S., Berends, H., Deken, F., & Tuertscher, P. (2020). Complementors as connectors: Managing open innovation around digital product platforms. *R&D Management, 50*(1), 18–30. https://doi.org/10.1111/radm.12371

Hsiao, T.-Y., Chuang, C.-M., & Huang, L. (2018). The contents, determinants, and strategic procedure for implementing suitable green activities in star hotels. *International Journal of Hospitality Management, 69*, 1–13. https://doi.org/10.1016/j.ijhm.2017.10.005

Huang, M.-H., & Rust, R. T. (2021). Engaged to a robot? The role of AI in service. *Journal of Service Research, 24*(1), 30–41. https://doi.org/10.1177/1094670520902266

Humphreys, A., & Carpenter, G. S. (2018). Status games: Market driving through social influence in the US wine industry. *Journal of Marketing, 82*(5), 141–159. https://doi.org/10.1509/jm.16.0179

Hunke, F., Satzger, G., & Tuunanen, T. (2024). Reuse of service concept elements for modular service design. *Journal of Service Management, 35*(6), 216–241. https://doi.org/10.1108/JOSM-04-2024-0171

Huvila, I., Anderson, T. D., Jansen, E. H., McKenzie, P., & Worrall, A. (2017). Boundary objects in information science. *Journal of the Association for Information Science and Technology, 68*(8), 1807–1822. https://doi.org/10.1002/asi.23817

Jaakkola, E., Meiren, T., Witell, L., Edvardsson, B., Schäfer, A., Reynoso, J., Sebastiani, R., & Weitlaner, D. (2017). Does one size fit all? New service development across different types of services. *Journal of Service Management, 28*(2), 329–347. https://doi.org/10.1108/JOSM-11-2015-0370

Jeppesen, L. B., & Frederiksen, L. (2006). Why do users contribute to firm-hosted user communities? The case of computer-controlled music instruments. *Organization Science, 17*(1), 45–63. https://doi.org/10.1287/orsc.1050.0156

Karsten, H., Lyytinen, K., Hurskainen, M., & Koskelainen, T. (2001). Crossing boundaries and conscripting participation: Representing and integrating knowledge in a paper machinery project.

*European Journal of Information Systems, 10*(2), 89–98. https://doi.org/10.1057/palgrave.ejis.3000395

Kim, K.-J., & Meiren, T. (2009). New service development process. In G. Salvendy & W. Karwowski (Eds.), *Introduction to Service Engineering* (pp. 253–267). John Wiley & Sons. https://doi.org/10.1002/9780470569627.ch12

Van Knippenberg, D., & Stam, D. (2014). Visionary leadership 12. *The Oxford handbook of leadership and organizations*, 241–259.

Kopalle, P. K., Kumar, V., & Subramaniam, M. (2020). How legacy firms can embrace the digital ecosystem via digital customer orientation. *Journal of the Academy of Marketing Science, 48*, 114–131. https://doi.org/10.1007/s11747-019-00694-2

Kreuzer, E., & Aschbacher, H. (2014). Strategiebasiertes und Agiles Service Engineering: Dienstleistungsinnovationen mit System durch Kundenintegration, interdisziplinäres, inkrementelles und iteratives Vorgehen. *Innovationsstrategien: Von Produkten und Dienstleistungen zu Geschäftsmodellinnovationen*, 103–115.

Kroh, J., & Schultz, C. (2023). The more the better? The role of stakeholder information processing in complex urban innovation projects for green transformation. *International Journal of Project Management, 41*(3), 102466. https://doi.org/10.1016/j.ijproman.2023.102466

Kroh, J., Luetjen, H., Globocnik, D., & Schultz, C. (2018). Use and efficacy of information technology in innovation processes: The specific role of servitization. *Journal of Product Innovation Management, 35*(5), 720–741. https://doi.org/10.1111/jpim.12445

Kumar, V., & Reinartz, W. (2016). Creating enduring customer value. *Journal of Marketing, 80*(6), 36–68. https://doi.org/10.1509/jm.15.0414

Langes, B., Peters, C., Boes, A., & Leimeister, J. M. (2023). Innovationen für datenbasierte Wertschöpfung. Mit internetbasierten Dienstleistungen die Zukunft der Wirtschaft gestalten. In *ISF München, München.*

Langes, B., & Vogl, E. (2019). Arbeit in der Informationsökonomie. In A. Boes & B. Langes (Eds.), *Die Cloud und der digitale Umbruch in Wirtschaft und Arbeit: Strategien.* Best Practices und Gestaltungsimpulse.

Larivière, B., Bowen, D., Andreassen, T. W., Kunz, W., Sirianni, N. J., Voss, C., Wünderlich, N. V., & De Keyser, A. (2017). 'Service encounter 2.0': An investigation into the roles of technology, employees and customers. *Journal of Business Research, 79*, 238–246. https://doi.org/10.1016/j.jbusres.2017.03.008

Lawrence, T., Suddaby, R., & Leca, B. (2011). Institutional work: Refocusing institutional studies of organization. *Journal of Management Inquiry, 20*(1), 52–58. https://doi.org/10.1177/1056492610387222

Leimeister, J. M. (2020). *Dienstleistungsengineering und -management: Data-driven service innovation* (2 ed.). Springer Gabler, Berlin. https://doi.org/10.1007/978-3-662-59858-0

Liu, Z., Zhang, W., & Zhao, F. (2022). Impact, challenges and prospect of software-defined vehicles. *Automotive Innovation, 5*, 180–194. https://doi.org/10.1007/s42154-022-00179-z

Luhmann, N. (1995). *Social systems*. Stanford University Press.

Lusch, R. F., & Nambisan, S. (2015). *Service Innovation. MIS Quarterly, 39*(1), 155–176.

Lütjen, H., Schultz, C., Tietze, F., & Urmetzer, F. (2019). Managing ecosystems for service innovation: A dynamic capability view. *Journal of Business Research, 104*, 506–519. https://doi.org/10.1016/j.jbusres.2019.06.001

Luu, T. T. (2022). Fostering green service innovation perceptions through green entrepreneurial orientation: The roles of employee green creativity and customer involvement. *International Journal of Contemporary Hospitality Management, 34*(7), 2640–2663. https://doi.org/10.1108/IJCHM-09-2021-1136

Maglio, P. P., Vargo, S. L., Caswell, N., & Spohrer, J. (2009). The service system is the basic abstraction of service science. *Information Systems and e-Business Management, 7*(4), 395–406. https://doi.org/10.1007/s10257-008-0105-1

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science, 2*(1), 71–87.

March, S. T., & Smith, G. F. (1995). Design and natural science research on information technology. *Decision Support Systems, 15*(4), 251–266. https://doi.org/10.1016/0167-9236(94)00041-2

Melnychuk, T., Schultz, C., & Wirsich, A. (2021). The effects of university–industry collaboration in preclinical research on pharmaceutical firms' R&D performance: Absorptive capacity's role. *Journal of Product Innovation Management, 38*(3), 355–378. https://doi.org/10.1111/jpim.12572

Michalke, S., Lohrenz, L., Lattemann, C., & Robra-Bissantz, S. (2022). Exploring engagement, well-being, and welfare on engagement platforms: Insight into the personal service sector from the DACH region. *Electronic Markets, 32*(4), 2429–2444. https://doi.org/10.1007/s12525-022-00589-1

Moliner-Tena, M. Á., Monferrer-Tirado, D., Estrada-Guillén, M., & Vidal-Meliá, L. (2023). Sustainable service ecosystems from the transformative value perspective: A study in tourism destinations. *Corporate Social Responsibility and Environmental Management, 30*(1), 342–357. https://doi.org/10.1002/csr.2358

Nenonen, S., Storbacka, K., & Windahl, C. (2019). Capabilities for market-shaping: Triggering and facilitating increased value creation. *Journal of the Academy of Marketing Science, 47*, 617–639. https://doi.org/10.1007/s11747-019-00643-z

Owen, R., Stilgoe, J., Macnaghten, P., Gorman, M., Fisher, E., & Guston, D. (2013). A framework for responsible innovation. *Responsible innovation: managing the responsible emergence of science and innovation in society*, 27–50. https://doi.org/10.1002/9781118551424.ch2

Paukstadt, U., & Becker, J. (2021). From energy as a commodity to energy as a service—A morphological analysis of smart energy services. *Schmalenbach Journal of Business Research, 73*(2), 207–242. https://doi.org/10.1007/s41471-021-00111-x

Peters, C., & Leimeister, J. M. (2013). TM3-A modularization method for telemedical services: Design and evaluation. *European Conference on Information Systems (ECIS).*

Poeppelbuss, J., Ebel, M., & Anke, J. (2022). Iterative uncertainty reduction in multi-actor smart service innovation. *Electronic Markets, 32*(2), 599–627. https://doi.org/10.1007/s12525-021-00500-4

Ravindran, A. R., Griffin, P. M., spsampsps Prabhu, V. V. (2018). *Service systems engineering and management* (1 ed.). CRC Press, Boca Raton. https://doi.org/10.1201/9781351054188

Riemer, K., & Johnston, R. B. (2019). Disruption as worldview change: A Kuhnian analysis of the digital music revolution. *Journal of Information Technology, 34*(4), 350–370. https://doi.org/10.1177/0268396219835101

Rindfleisch, A., O'Hern, M., & Sachdev, V. (2017). The digital revolution, 3D printing, and innovation as data. *Journal of Product Innovation Management, 34*(5), 681–690. https://doi.org/10.1111/jpim.12402

Roth, A., Benz, C., Wilga, M. Hottum, P. Langes, B., Lewandowski, T., Nägele, R., Peters, C., & Satzger, G. (2024). Value creation in the information economy: Shaping the triad of AI, service, and human work. *Journal of Service Management Research* (forthcoming).

Russell-Bennett, R., Fisk, R. P., Rosenbaum, M. S., & Zainuddin, N. (2019). Commentary: Transformative service research and social marketing—converging pathways to social change. *Journal of Services Marketing, 33*(6), 633–642. https://doi.org/10.1108/JSM-10-2018-0304

Satzger, G., Benz, C., Böhmann, T., spsampsps Roth, A. (2022). Servitization and digitalization as "Siamese twins": Concepts and research priorities. In B. Edvardsson spsampsps B. Tronvoll (Eds.), *The Palgrave Handbook of Service Management* (pp. 967–989). Springer. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-91828-6_46

Schreyögg, G., & Sydow, J. (2011). Organizational path dependence: A process view. *Organization Studies, 32*(3), 321–335. https://doi.org/10.1177/0170840610397481

Schultz, C., Salomo, S., de Brentani, U., & Kleinschmidt, E. J. (2013). How formal control influences decision-making clarity and innovation performance. *Journal of Product Innovation Management, 30*(3), 430–447. https://doi.org/10.1111/jpim.12009

Schultz, C., Graw, J., Salomo, S., & Kock, A. (2019). How project management and top management involvement affect the innovativeness of professional service organizations—An empirical study on hospitals. *Project Management Journal, 50*(4), 460–475. https://doi.org/10.1177/8756972819857893

Schütte, R., Ahlemann, F., Becker, J., Legner, C., Lehrer, C., Wiesche, M., & Richter, G. (2022). Quo Vadis information systems research in times of digitalization? *Business & Information Systems Engineering, 64*(4), 529–540. https://doi.org/10.1007/s12599-022-00759-7

Schweitzer, F., Röth, T., Birkinshaw, J., & Barczak, G. (2024). Playing the political game of innovation: An integrative framework and future research directions. *Journal of Product Innovation Management, 41*(3), 531–547. https://doi.org/10.1111/jpim.12735

Sein, M. K., Henfridsson, O., Purao, S., Rossi, M., & Lindgren, R. (2011). Action design research. *MIS Quarterly, 35*(1), 37–56. https://doi.org/10.2307/23043488

Solomon, M. R., Surprenant, C., Czepiel, J. A., & Gutman, E. G. (1985). A role theory perspective on dyadic interactions: The service encounter. *Journal of Marketing, 49*(1), 99–111. https://doi.org/10.1177/002224298504900110

Star, S. L., & Griesemer, J. R. (1989). Institutional ecology, "translations", and boundary objects: Amateurs and professionals in Berkeley's Museum of Vertebrate Zoology. *Social Studies of Science, 19*(3), 387–420. https://doi.org/10.1177/030631289019003001

Teixeira, J. G., Patrício, L., Huang, K.-H., Fisk, R. P., Nóbrega, L., & Constantine, L. (2017). The MINDS method: Integrating management and interaction design perspectives for service design. *Journal of Service Research, 20*(3), 240–258. https://doi.org/10.1177/1094670516680033

Teixeira, J. G., Patrício, L., & Tuunanen, T. (2019). Advancing service design research with design science research. *Journal of Service Management, 30*(5), 577–592. https://doi.org/10.1108/JOSM-05-2019-0131

Töytäri, P., Turunen, T., Klein, M., Eloranta, V., Biehl, S., Rajala, R., & Hakanen, E. (2017). Overcoming institutional and capability barriers to smart services. *Hawaii International Conference on System Sciences (HICSS-50).*

United Nations. (2023). *The 17 goals*. Available at https://sdgs.un.org/goals. Accessed 5 June 2024.

Vargo, S. L., & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing, 68*(1), 1–17. https://doi.org/10.1509/jmkg.68.1.1.24036

Vargo, S. L., & Lusch, R. F. (2008). Why "service"? *Journal of the Academy of Marketing Science, 36*, 25–38. https://doi.org/10.1007/s11747-007-0068-7

Vargo, S. L., & Lusch, R. F. (2016). Institutions and axioms: An extension and update of service-dominant logic. *Journal of the Academy of Marketing Science, 44*(1), 5–23. https://doi.org/10.1007/s11747-015-0456-3

Vargo, S. L., Peters, L., Kjellberg, H., Koskela-Huotari, K., Nenonen, S., Polese, F., Sarno, D., & Vaughan, C. (2023). Emergence in marketing: An institutional and ecosystem framework. *Journal of the Academy of Marketing Science, 51*(1), 2–22. https://doi.org/10.1007/s11747-022-00849-8

Vink, J., Koskela-Huotari, K., Tronvoll, B., Edvardsson, B., & Wetter-Edman, K. (2021). Service ecosystem design: Propositions, process model, and future research agenda. *Journal of Service Research, 24*(2), 168–186. https://doi.org/10.1177/1094670520952537

Voegtlin, C., Scherer, A. G., Stahl, G. K., & Hawn, O. (2022). Grand societal challenges and responsible innovation. *Journal of Management Studies, 59*(1), 1–28. https://doi.org/10.1111/joms.12785

Walter, S. G., Walter, A., & Müller, D. (2015). Formalization, communication quality, and opportunistic behavior in R&D alliances between competitors. *Journal of Product Innovation Management, 32*(6), 954–970. https://doi.org/10.1111/jpim.12209

Wiesche, M., Böhm, N., & Schermann, M. (2024). Digital desire paths: Exploring the role of computer workarounds in emergent information systems design. *European Journal of Information Systems, 33*(2), 145–160. https://doi.org/10.1080/0960085X.2024.2313537

Wiesche, M., Uebernickel, F., Byler, E., Garcia-Cifuentes, J. P., Suzuki, S., Vignoli, M., Leifer, L., Lang, M., Feldmann, N., & Höltää-Otto, K. (2018). Teaching innovation in interdisciplinary environments: Toward a design thinking syllabus. *Proceedings of the 2018 AIS SIGED International Conference on Information Systems Education and Research*.

Winter, J. (2017). Europa und die Plattformökonomie – Wie datengetriebene Geschäftsmodelle Wertschöpfungsketten verändern. In M. Bruhn & K. Hadwich (Eds.), *Dienstleistungen 4.0: Geschäftsmodelle-Wertschöpfung-Transformation. Band 2. Forum Dienstleistungsmanagement* (pp. 71–88). Springer Gabler. https://doi.org/10.1007/978-3-658-17552-8_3

Wirtz, J., Patterson, P. G., Kunz, W. H., Gruber, T., Lu, V. N., Paluch, S., & Martins, A. (2018). Brave new world: Service robots in the frontline. *Journal of Service Management, 29*(5), 907–931. https://doi.org/10.1108/josm-04-2018-0119

Wirtz, J., Lin, C., & Das, G. (2022). Cost-effective health care developments and research opportunities in China, India and Singapore. *Journal of Services Marketing, 36*(4), 461–466. https://doi.org/10.1108/JSM-07-2021-0242

Wirtz, J., Kunz, W. H., Hartley, N., & Tarbit, J. (2023). Corporate digital responsibility in service firms and their ecosystems. *Journal of Service Research, 26*(2), 173–190. https://doi.org/10.1177/10946705221130467

Wünderlich, N. V., Hogreve, J., Chowdhury, I. N., Fleischer, H., Mousavi, S., Rötzmeier-Keuper, J., & Sousa, R. (2020). Overcoming vulnerability: Channel design strategies to alleviate vulnerability perceptions in customer journeys. *Journal of Business Research, 116*, 377–386. https://doi.org/10.1016/j.jbusres.2019.07.027

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