Service system transformation through service design: Linking analytical dimensions and service design approaches

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ARTICLE INFO

ABSTRACT

The increasingly interconnected world is leading to continuous and profound transformations within and among service systems (e.g., firms, industries, societies). While service research studying such transformations is growing, the literature is missing a conceptualization of service system transformation (SST) that accounts for the richness and diversity of the phenomenon. This hinders the development of approaches to intentionally influence SST toward desired paths. Providing an integrated, multidimensional understanding of SST, this paper explores how service design can intentionally influence SST. To do so, the paper contributes by advancing conceptual clarity of SST and delineating three analytical dimensions—*scope, endurance,* and *paradigmatic radicalness*—that, in combination, provide a framework for understanding the diversity of the transformations unfolding within and across service systems. Building upon this conceptualization, the paper systematizes how service design approaches can foster SST along these dimensions, setting the ground for service design to further strengthen its transformative potential.

1. Introduction

Service firms operate in increasingly interconnected contexts, which generate significant complexity and transformational pressures for these organizations (Ostrom et al., 2021). This is well illustrated within the hospitality and tourism sector in which both the service organizations and the industry as a whole are going through constant transformations due to pervasive trends such as the rise of the sharing economy, digitalization, and increasing environmental consciousness among consumers (see e.g., Aksoy et al., 2019; Baggio, 2008; Buhalis et al., 2019). In addition, the COVID-19 pandemic has led to further transformations by significantly limiting the operations of hospitality and tourism organizations with lockdowns, physical distancing requirements, and increased hygiene standards (WTTC, 2020a). This creates a pressing

need to better understand such transformation processes and how service organizations and other actors can more intentionally influence them (Field et al., 2021).

To approach such complexity effectively requires the adoption of a systemic understanding of service phenomena that broadens the unit of analysis beyond the more common focus on dyadic service interactions. The use of the concept of *service system* as the basic abstraction of the dynamic and interdependent configurations of people, technologies, and other resources that interact with other service systems (e.g., households, firms) to create mutual value (Maglio et al., 2009) seeks to capture this broader phenomenon. While scholars are increasingly studying how and why service systems transform over time (Lusch et al., 2016; Wilden et al., 2017), to date no comprehensive conceptualization of such transformations exists. Rather, existing studies vary considerably in

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terms of both the temporality of the transformation and the level of the transformation examined (Previte & Robertson, 2019), lacking a shared conceptual foundation. While some studies have furthered the understanding of service system transformation (SST) by detailing its institutional nature (e.g., Vargo & Akaka 2012; Koskela-Huotari et al., 2016), others conceptualize it as a conflict between two types of strategic actors, incumbents and challengers (Skålén et al., 2015) or as a radical phase transition (Goda & Kijima 2015; Polese et al., 2021). Hence, although highly illuminating in detailing the richness of SST as a phenomenon, prior research is missing an integrated understanding of SST that would account for such versatility. This is problematic for the development of approaches that service organizations and other actors could use to address SST. Without an integrated understanding of SST, it becomes difficult, if not impossible, to meaningfully influence such transformations.

Service design is increasingly viewed as an intentional pathway to SST (Patrício et al., 2018a; Vink et al., 2021) as it integrates a service perspective with a design approach (Joly et al., 2019). On the one hand, a service perspective provides the analytical framework for the interpretation of service systems and value cocreation processes (Wetter-Edman et al., 2014). On the other hand, design offers an action-oriented approach to intentionally influence SST toward desired paths (cf., Simon, 1969). Service design originally focused on translating the understanding of human experiences for improving dyadic service interactions (Sangiorgi, 2009), focusing more on incremental and less systemic change. More recently, service design has been proposed as a transformative force that can go beyond enhancing service experiences to designing for more systemic transformation (Patrício et al., 2020). Along this line, initial efforts have advanced the design for networked service systems (Patrício et al., 2018b), the development of platforms and capabilities for ongoing change (Karpen et al., 2017; Sangiorgi et al., 2019b), and the design for institutional change in service systems (Vink et al., 2019; Vink et al., 2021). Despite these recent efforts in addressing specific challenges of systemic change through service design, a more detailed and systematic understanding of how service design can influence SST in all its complexity is still missing.

The purpose of this paper is two-fold: first to provide an integrated understanding of SST that accounts for its richness and diversity as a phenomenon and then to build on this conceptualization to explore how service design can be used to intentionally influence SST. To do this we, first, synthesize prior research on SST and provide an overarching conceptualization and definition of SST by building on the commonalities within the existing literature. We then use literature from management theory to delineate three analytical dimensions—scope, endurance, and paradigmatic radicalness—that, in combination, provide a framework to understand the diversity of the transformations unfolding within and across service systems. Building on this integrated and multidimensional conceptualization of SST, we explore service design as a transformative force toward SST by examining service design literature to articulate how different service design approaches can foster intentional SST along the identified dimensions. Throughout the text, we use illustrative examples from the hospitality and tourism sector to contextualize the conceptual developments made in the paper.

2. Service system transformation and its analytical dimensions

Systemic approaches within service research, such as service-dominant logic (Vargo & Lusch, 2016; 2017), service science (Maglio et al., 2009; Spohrer et al., 2007) and transformative service research (Anderson et al., 2013) all have varying foci, but jointly advocate a perspective that service research is "the study of an evolving ecology of nested, networked *service system* entities, from people to families to businesses to nations" (Barile et al., 2016, p. 657, emphasis added). Service systems are connected via shared institutional arrangements and form systems of service systems that are also called service ecosystems (Barile et al., 2016; Vargo & Akaka, 2012; Vargo & Lusch, 2011).

Institutional arrangements play a central role in how value cocreation occurs within and among service systems as they consist of the rules, norms, assumptions, and beliefs that define appropriate behavior and make life meaningful (Vargo & Lusch, 2016).

Service systems are dynamic entities that are capable of adapting to changing conditions through transformation (Spohrer et al., 2007; Skålén et al., 2015). These transformations within and across service systems are the increasing subject of study within service research (e.g., Lusch et al., 2016; Wilden et al., 2017). Extant work on the subject has been drawing inputs from varying enabling theories such as structuration theory (e.g., Blocker & Barrios, 2015; Vargo & Akaka 2012), institutional theory (e.g., Kleinaltenkamp et al., 2018; Koskela-Huotari et al., 2016), strategic action field theory (e.g., Skålén et al., 2015), or systems and panarchy theory (e.g., Goda & Kijima 2015; Polese et al., 2021, Vargo et al., 2020). Although highly illuminating of the richness and diversity of SST as a phenomenon, these various contributions have not so far converged into an integrative conceptualization. As such, the current literature is missing more comprehensive understanding of SST that would enable a more systematic exploration of how such transformation can be intentionally influenced.

To advance theorizing on service system transformation, we first develop an overarching conceptualization of SST by identifying foundational elements commonly discussed within prior research. Table 1 provides an illustrative overview of this research. While the conceptualizations of SST vary based on the theoretical input or perspective used, the process is commonly understood as the reconfiguring of actors, resources, and their integration practices within the service systems (see e.g., Goda & Kijima, 2015; Koskela-Huotari et al., 2016; Skålén et al., 2015). Much of the prior research also highlights that such visible structural changes in actors, resources, and their integration practices correspond with changes in the service system's invisible structure and vice versa. This invisible structure is often conceptualized as the institutional arrangements, that is, assemblages of enduring norms, rules, assumptions, and beliefs, that the actors of the service system share (see e.g., Kleinaltenkamp et al., 2018; Koskela-Huotari et al., 2016; Vargo & Akaka 2012). Such institutional arrangements are not seen as external to service (eco)systems and the actors they comprise, but as actor-generated and internal structure of the service systems that lend them their systemic form (Vargo & Akaka 2012; Vargo & Lusch, 2016). Based on these commonalities within the existing literature, we define SST as *the reconfiguring of actors, resources, resource-integration practices, and the corresponding institutional arrangements within or across service systems.*

This integrated definition of SSTs as reconfigurations within and across service systems allows for incorporating the richness of the phenomenon that the prior literature highlights, for example, by showing that SST can be driven by both endogenous and exogenous triggers and unfolds as a consequence of intentional and unintentional action. Hence, while some scholars posit that service systems can transform due to exogenous causes, such as external shocks and megatrends (Kleinaltenkamp et al., 2018; Skålén et al., 2015), others highlight that transformations can also be initiated endogenously; that is, from within a service system, for example, by actors innovating novel ways of integrating resources (e.g., Koskela-Huotari et al., 2016; Vargo et al., 2020). As service systems are interlinked, an endogenous transformation in one service system may spark a transformation in another service system and, thus, represent an exogenous trigger from the point of view of the latter service system (cf., Skålén et al.,2015). In Goda and Kijima's (2015, p. 85) words "service ecosystems are constantly adapting to changing contextual requirements and are simultaneously creating these changing contexts in the process." Goda and Kijima (2015) also highlight that SST can be the outcome of both intentional and unintentional actions. To intentionally challenge dominant patterns within or across service systems, actors need to "become conscious of their roles in reproducing structures and elect to instead make new, imaginative choices" (Blocker & Barrios, 2015, p. 268). However, even in cases in which intentional action is involved, scholars emphasize that the

Table 1
Overview of selected prior research on service system transformation.

Source	Trigger of SST	Description or conceptualization of SST	Enabling theory
Vargo and Akaka (2012)	N/A	"…the enactment of resource-integration practices contributes to the reproduction of service systems (composed of systems and structures) … Because structures of rules and resources are interrelated with systems of reproduced relationships, changes in structures correspond with changes in systems as well." (p. 215)	Structuration theory
Blocker and Barrios (2015)	Endogenous: Agents intentionally challenge dominant patterns	"…occur when agents become conscious of their roles in reproducing structures and elect to instead make new, imaginative choices to challenge dominant patterns…. transformative value can arise as organizations and individuals contest and alter the schemas and resources that define their consumption reality and the broader social structures" (p. 268)	Structuration theory
Goda and Kijima (2015)	Endogenous and exogenous: internally adapted or externally accumulated resources	"…the adaptive cycle of ecosystem is a process that accounts for both stability and change. It periodically generates variability and novelty, either by internally accumulated resources through genetic mutations or adaptation, or by externally accumulating resources that would change the internal dynamics of an ecosystem. … the adaptive cycle sometimes may break down and/or collapse into a qualitatively different state. It is a result of structural change along the orbit and call it phase transition." (p. 86–88)	Panarchy and Transition Management Theory
Skålén et al. (2015)	Exogenous: External shocks that trigger conflicts between reflexive actors	"Service systems are configurations of actors and resources in which actors cocreate value by integrating available resources to benefit individuals or collectives….transformation of service systems derives from the conflict between two types of actors—incumbents and challengers—within episodes of contention" (p. 252–261)	Strategic action field theory
Koskela-Huotari et al. (2016)	Endogenous: Innovation in the form of intentional institutional work	"Innovation as a process of breaking, making and maintaining institutionalized rules of resource integration results in institutional reconfigurations within or across service ecosystems. … such institutional reconfigurations manifest themselves in service ecosystems and allow actors to cocreate value in novel and useful ways by a) including new actors, b) redefining roles of actors and c) reframing resources." (p. 2969)	Institutional theory and especially the concept of institutional work
Kleinaltenkamp et al. (2018)	Exogenous: Megatrends	"…change of existing service ecosystems takes place by creating new institutional arrangements that consist of proto-institutions as institutional subsystems that subsequently affect the institutional arrangements of the existing service ecosystems. Moreover, the specific proto-institutional elements that initiate and then dominate this change process influence the others and then generate new configurations of institutional arrangements. As a consequence, it is the interactions among the proto-institutional elements and their carriers that determine the transformation of service ecosystems." (p. 628)	Institutional theory and especially the concept of proto-institution
Vargo et al. (2020)	Endogenous: Innovation in the form of intentional institutional work	"Because institutional arrangements influence the way resources are integrated and value is cocreated, diffusion can be conceptualized as an emergent, cocreative process that involves multiple actors integrating new resources and altering their institutional arrangements. Institutional work continually occurs as new resources are integrated with existing resources and resource integration draws on and feeds into pre-existing institutional arrangements. As the number of individuals who integrate a new resource increases, the diffusion process spreads throughout the wider ecosystem" (p. 529)	Institutional theory, Complex adaptive systems
Polese et al. (2021)	Exogenous and endogenous: environmental disturbances and internal interactions	"Emergence in a service ecosystem denotes the phenomenon of new properties arising in the ecosystem (at the micro, meso or macro level of analysis) producing minor or potentially major changes to the ecosystem. The properties include new resources, value, institutional arrangements and practices … A phase transition of a service ecosystem is a large-scale step change which occurs when external environmental disturbances and internal interactions dislodge the ecosystem from a state of stability, into de-institutionalization and then re-institutionalization, when it achieves a new stable state. The new state is characterized by the emergence of by new institutional arrangements and value that provide order and organization to the interactions of the service ecosystem." (p. 30)	Systems theory

resulting SST is always characterized by emergence and, thus, beyond the control of any single actor within a service system (e.g., Polese et al., 2021; Vink et al., 2021).

To further understand the diversity of SST as a phenomenon illustrated by prior research, we draw on management literature to delineate analytical dimensions through which transformations can unfold within and across service systems. The resulting analytical dimensions of *scope, endurance,* and *paradigmatic radicalness* of SST are elaborated and theoretically substantiated in the following sections.

2.1. Scope of service system transformation

The first dimension, scope of SST, captures how widespread and comprehensive the reconfiguration is within and across service systems. The prior research on SST highlights the scalability of the service system concept. According to Vargo and Akaka (2012, p. 210), a "service system can be a person, an organization, or even a nation." This means that a service system can be considered both as a whole system and as part of a larger service (eco)system depending on the level of aggregation and perspective of analysis (Siltaloppi et al., 2016). Previous research illustrates this as the studied service systems vary from a manufacturing organization (Koskela-Huotari et al.,2016), to a national healthcare system (Kleinaltenkamp et al.,2018), to an uprising against a repressive regime (Skålén et al., 2015). Consequently, this implies that SST necessarily refers to reconfigurations of varying sizes depending on the type of service system in question. This leads to scope being an important dimension to understand the diversity of SST as a phenomenon.

To further theorize on scope, we draw on the work of Colyvas and Jonsson (2011) who highlight the importance of distinguishing between how transformation spreads and how it becomes persistent within social systems. In the context of SST, this refers to recognizing how a particular reconfiguration within and among service systems can spread widely, without becoming legitimate and persistent. On the other hand, there are reconfigurations that are not widely diffused among the broader service (eco)system, but can become highly institutionalized within a particular service system or its part. This draws attention to scope as an important dimension of SST that is distinct from its endurance as a wide scope of SST does not automatically imply endurance, and vice versa. An example of an SST with a wide scope, but lack of endurance, in the hospitality and tourism context, would be electric scooter rentals, such as Lime and Bird, which for a few years became almost ubiquitous in leading urban destinations, but then turned into a liability and consequently have started phasing out since 2020 (Herrera, 2020). The ride-sharing scooter concept relied on the goodwill of destination residents to charge scooters for a small compensation and the riders would use them on demand, when walking or public transportation is inconvenient. The lack of agreement surrounding regulations on traffic safety, parking zoning, and riding restrictions prevented electric scooters from becoming a legitimate disruptor in the destination transportation sector (McFarland, 2019). An example of an SST with a narrower scope, but a persistant nature could be found in the development of tourism sustainability (Asmelash & Kumar, 2019). Although eco-friendly practices have become expected norm by customers of the tourism and hospitality sector for some time (Baker et al., 2014), sustainable tourism that comprehensively addresses economic, environmental, socio-cultural, and institutional sustainability (Asmelash & Kumar, 2019) has yet to spread beyond niche markets such as eco-friendly hotels and island destinations (Rockett & Ramsey, 2017).

One of the processes that closely connects with the scope dimension is diffusion which "reflects the spread of a practice or organizational structure within a social system" (Colyvas & Jonsson, 2011, p. 30). The diffusion process in service systems can be influenced by both relational and structural factors of the service system and take "many forms, which depend less on the characteristics or resilience of what spreads, and more on the form that reinforcement takes" (Colyvas & Jonsson, 2011, p. 36). Relatedly, Vargo et al. (2020) argue that innovative ideas can

spread both horizontally and vertically within service (eco)system. According to them (Vargo et al., 2020, p. 529), horizontal diffusion can be seen by looking across a single level of analysis (e.g., intra-niche and inter-niche applications), while vertical diffusion can be seen from the perspective of different levels of analysis (e.g., restructuring of both meso- and macro-level landscapes).

Several examples of both horizontal and vertical diffusion of SST within hospitality and tourism can be found in connection to the introduction of information and communication technologies from the late 1990s onwards. Whereas software-as-a-service model based on cloud computing technology became popularized with salesforce customer relationship management platforms in 1999, it took nearly ten years for cloud platforms to spread horizontally to the tourism and hospitality industry (Ady, 2019). This horizontally diffused SST happened when cloud-based hotel property management systems (PMS) began replacing legacy on-site systems and changed how hotels approach developing their information systems infrastructure, storing guest data, and servicing their guests. Cloud PMS allowed front desk employees to be more mobile and check-in/check-out guests from any location and any device. On the other hand, the rise of the home-sharing platforms epitomizes a vertically diffused SST in the hospitality and tourism context (Evans & Gawer, 2016). Founded in 2008 as a distribution channel that facilitates home sharing, in 2020 Airbnb topped $100 billion on its first day of public trading (Griffith, 2020), making it the most valuable lodging company in the world and turning accommodation services upside down. Easy and ubiquitous mobile technologies enabled individuals and Airbnb to collaborate in the renting and managing of rooms outside the traditional accommodation market, bridging the micro-level assets and the rising societal preference for more idiosyncratic and localized experience at the macro level as well as industry practices and state legislation at the meso level.

2.2. Endurance of service system transformation

The second dimension, endurance of SST, describes how persistent and legitimate the reconfiguration is within and across service systems. Highlighting endurance as a separate dimension from the scope of transformation is also aligned with existing TSR research which argues that transformation should consider more "*enduring* changes than a single service experience, as it considers *the lasting influence* on consumers and society as a whole" (Previte & Robertson, 2019, p. 673, emphasis added). Similarly, in their conceptualization of transformative value, Blocker and Barrios (2015) emphasize changes that vary in their scope, but go beyond a purchase cycle and, thus, are enduring in their nature. Hence, although, the processes of how a change spreads and how it persists are often used synonymously or simultaneously (cf., Colyvas & Jonsson, 2011), scope and endurance of SST need to be considered as separate dimensions.

According to Colyvas and Jonsson (2011) the persistence of change within a social system is related to the process of institutionalization. As such, the endurance dimension of SST is closely connected with the reconfiguration of the invisible structure, that is, institutions and institutional arrangements within service system. However, endurance as dimension is not the same as 'institutional change' as the process of institutionalization refers to how social structures, such as, "social processes, obligations, or actualities come to take on a rule-like status in social thought and action" (Meyer & Rowan, 1977, p. 341) and, thus, become institutions. In other words, while institutional change can refer to situations where new social structures appear and might potentially replace prevailing social structures only momentarily, endurance of such change requires also institutionalization which refers to the process through which these new social structures might become 'law-like entities' that are reproduced without conscious deliberation. This corresponds with prior research on SST which acknowledges that intentional efforts to change institutions, for example, through institutional work, do not automatically result in successful and persistent change in service

systems (see e.g., Koskela-Huotari et al., 2016; Vargo et al., 2015). More specifically, this work highlights that enduring transformation "does not automatically occur when actors (e.g. firms), or groups of actors (e.g. innovation networks) introduce new value propositions, but only when new practices (i.e. solutions) become institutionalized" (Vargo et al., 2016, p. 4). According to Koskela-Huotari et al. (2016, p. 2966) such "institutionalization of new rules of resource integration occurs through multiple adjustments and changes over time, until a common template becomes accepted and shared."

An example of a persistent and thus, highly institutionalized SST within the hospitality and tourism context would be the suite of Safe Travels Global Protocols by the World Travel and Tourism Council. The protocols provide tools and guidelines for multiple aspects involved in realizing the shared vision of creating a clean and safe travel experience, ranging from aviation, hospitality, tour guide operation, to working from home (WTTC, 2020b). The protocols are a result of integrated efforts by travel and hospitality companies, medical experts, and regulatory organizations that developed a consensus regarding cleaning standards and sanitary (Blumenthal, 2020). On the contrary, a reconfiguration in the travel system that has been widely debated and whose institutionalization process is only at the very beginning, are digital health passports that verify immunization. According to Schlagenhauf et al. (2021), this seemingly novel value proposition is not, however, entirely new to the health considerations of tourism and hospitality. Although vaccination proofs have been institutionalized by the International Health Regulations for other infectious diseases, such as yellow fever (WHO, 2016), the heterogeneous evidence, documentation, and access to COVID-19 vaccines poses both medical and equity concerns for COVID-19 vaccination passports that are currently hindering their institutionalization process as a 'common template' is yet to emerge.

2.3. Paradigmatic radicalness of service system transformation

The third dimension, paradigmatic radicalness of SST, refers to how disruptive the reconfiguration is in relation to the existing paradigmatic beliefs of the focal service system. Previous research highlights that both disruptive (Skålén et al., 2015) and non-disruptive transformation of resource integration practices and their corresponding institutional arrangements are possible within service systems (Kleinaltenkamp et al., 2018). In other words, SST does not necessarily lead to a total reconfiguring of the focal service system and its institutional arrangements. Instead, Kleinaltenkamp et al. (2018, p. 625) argue that although "new institutions emerge from the process and drive the further development of the service ecosystem, others remain unchanged, thus giving full continuity to the system from the past and guaranteeing certain continuity even during the ongoing change process." Aligned with this, Goda and Kijima (2015, p. 88) note that the transformation within service systems only sometimes leads the service system to "collapse into a qualitatively different state." They, like Polese et al. (2021), call these radical transformations as *phase transitions* within service (eco)systems.

To understand the above variation in the nature of SST, we adapt the Regime Evolution Framework of Dijk et al. (2015) to distinguish between sustaining and disruptive transformation at different levels of aggregation within and across service systems. According to Dijk et al. (2015, p. 267) the concept of 'market regime' refers to the "order of an industry" that can be applied at various levels of aggregation (e.g., global market, national market, end-product market). When connected with service systems, a regime corresponds with the dominant institutional arrangement guiding resource integration within a service system. Regime can also be seen as the paradigm of the service system, which is the deepest set of beliefs and unstated assumptions or the mindsets out of which the system arises (cf., Meadows, 2008). This implies that reconfigurations within and among service systems can occur within the limits of the dominant institutional arrangement and, thus, sustain such beliefs while changing other institutions within the arrangement. On the other hand, some reconfigurations are radical enough to disrupt such

beliefs. To fully appreciate the diversity of SST as a phenomenon, thus, requires the addition of a third dimension, paradigmatic radicalness, that depicts how disruptive the transformation is in relation to the existing paradigm of the focal service system.

Several examples of paradigmatically radical SSTs in the context of hospitality and tourism can be found in connection to the delicate balance between conservation and tourism traffic (Gutiérrez et al., 2017). During the COVID-19 pandemic, the British historian David Attenborough virtually navigates explorers through the breathtaking Great Barrier Reef, in an "interactive journey". Attenborough's journey challenges the fundamental assumptions that tourists need to experience certain locations themselves. Although such virtual visits were born out of necessity during travel restrictions, this type of immersive innovation (Bec et al., 2021) demonstrated both the feasibility and value of limiting the number of on-site tourists without sacrificing the travel experience. In doing so, the core assumptions of "last chance tourism destination" were successfully challenged, therefore eliminating the dichotomy between tourism traffic and conservation, and opening tourism for paradigmatic change from 'growth' to 'stewardship and sustainability' (Dwyer, 2018).

However, for sustainable tourism to move beyond such individual solutions and niche markets, it must disrupt the prevailing mindset within the hospitality and tourism sector with its alternative set of beliefs and assumptions. Solutions that do not challenge the dominant norms in the service system, such as airline carbon offset programs, should not be considered paradigmatically radical as they still sustain deeply held assumptions of, for example, maintaining an unhealthy growth in tourism traffic. There are, however, examples of tourism destinations that have used the global health crisis to rethink the future of tourism in a paradigmatically radical way. The local government in Amsterdam, for instance, has proposed a ban on sales of cannabis in coffee shops to international tourists, as well as a plan to relocate the infamous Red Lights District to the city outskirts (Holligan, 2021). Such measures could prevent a spike in tourist arrivals post-pandemic and hopefully shift the tourists' perceptions of Amsterdam to a destination that offers beauty and freedom at minimal costs to residents. Likewise, Venice officials, who have been fighting unsustainable growth in day visitors for many years, have introduced a visitor tracking system, which feeds real-time data on tourist traffic (Buckley, 2021). This initiative is the first step in the development of a sustainable tourism plan for Venice, aimed at capping the daily number of visitors, motivating longer stays, and drawing away tourists' attention from the main crowding points of Rialto Bridge and St Mark's Square.

In combination, the three analytical dimensions of SST provide a framework to understand the diversity of the ongoing or envisioned transformations unfolding within and across service systems. As such, they serve as a useful framework when actors aim to intentionally initiate a transformation or influence an ongoing transformation. In the following section, we explore how service design approaches can be used to influence SST in general as well as each of its analytical dimensions in particular.

3. Service design as an enabler of service system transformation

Service design is a human-centered and iterative approach to creating new service futures (Meroni & Sangiorgi, 2011). Originally, as mentioned, service design focused on understanding human experiences for designing better customer journeys within dyadic service interactions (Sangiorgi, 2009; Windahl et al., 2020), developing methods and tools for improving specific touchpoints and enhancing the service experience without purposefully rethinking service systems at large. As such, service design originated with a focus on reconfigurations characterized by lower levels of scope, endurance and paradigmatic radicalness.

More recently, service design strengthened its role as a transformative force in service systems (Patrício et al., 2018; Sangiorgi, 2011;

Vink et al., 2021), starting to pay more attention to organizational and social change dynamics (Sangiorgi et al., 2019), to promote institutional change as a driver for more enduring SST (Vink et al., 2021), or to design services as enablers of value cocreation among networks in complex service systems (Patrício et al., 2018). Despite these diverse initial efforts to address specific challenges of more systemic transformation, a more articulated understanding of how service design can participate, support and create the conditions for SST along the identified dimensions of scope, endurance and paradigmatic radicalness, is still missing.

This section examines how service design can intentionally enable SST toward desired futures. First, it explores service design approaches that contribute to SST as a whole. Second, it relates existing service design research with each dimension of SST delineated above, as shown in Table 2, particularly exploring higher levels of scope, endurance and paradigmatic radicalness, which were originally less addressed by service design. While these approaches are interconnected, understanding how they can particularly contribute to each dimension of SST can provide a basis for building and navigating through different transformative service design pathways.

3.1. Service design and service system transformation

Service design integrates a service perspective with a design approach (Joly et al., 2019). While a service perspective provides the analytical framework for the interpretation of service systems and value co-creation processes (Wetter-Edman et al., 2014), design offers an action-oriented approach to intentionally influence SST toward desired paths (Patrício et al., 2019). Some fundamental service design approaches address SST as a whole, namely action-orientation toward better futures, human-centeredness, and designing as a broader collective effort, as shown in Table 2.

Service design's action-orientation builds upon design as "devising courses of action aimed at changing existing situations into preferred ones" (Simon, 1969, p. 130). Compared with more descriptive disciplines, service design is a future and action-oriented approach that is grounded on an agentic orientation toward SST. Building upon Emirbayer and Mische's (1998, p. 971) projective element of agency, we relate service design to "the imaginative generation by actors of possible future trajectories of action, in which received structures of thought and action may be creatively reconfigured in relation to actors' hopes, fears, and desires for the future". As such, service design can be related to the imaginative generation of possible futures by service system actors. As they respond to the challenges and uncertainties of life, actors are capable of distancing themselves from the schemas and habits, and imaginatively engage with the future by reconfiguring these structures and inventing new possibilities for thought and action (cf. Emirbayer and Mische, 1998). On the other hand, service design embeds a betterment principle that illuminates the constant striving for the better, to increase wellbeing (Anderson et al., 2013; Karpen et al., 2017; Sangiorgi, 2011). While there is a call to be more critical of the contested and political nature of what is "good" (Vink et al., 2017), the action-orientation toward creating better futures is central to the transformative potential of service design.

Human-centeredness affirms that service design seeks to meaningfully satisfy human needs by building upon deep insights into multiple actors' holistic experiences that inspire the generation of new service futures (Karpen et al., 2017; Yu & Sangiorgi, 2018). Moreover, human-centeredness means that service design involves users during the design process, while the design team facilitates the codesign processes (Trischler et al., 2018), enabling empowerment while stimulating hope and imagination for the future (Sangiorgi, 2011).

Taking a transformative view of service design as creating new service futures also requires acknowledging that designing goes beyond the sole action of design experts to a broader collaborative effort where everybody designs (Manzini, 2015). This implies that the projective

element of agency of service design is decentralized from "designers" as individual expert practitioners, to "designing" with the collective of people engaged continuously with changing their performances and exchanges (Sangiorgi & Prendiville, 2017), thus recognizing the design agency of all actors (Vink et al., 2021). Design experts, therefore, can leverage participants' creativity and culture to support a dialogic and collaborative approach to service design, where they become part of an ongoing and broader change process that they support and facilitate, but cannot fully control (Manzini, 2015).

3.2. Service design and scope of service system transformation

Although service design has traditionally focused on enhancing dyadic interactions between customers and service providers, there has been increasing recognition of the necessity to also address a wider scope of transformation within and beyond organizational boundaries to address complex social challenges (Sangiorgi et al., 2017). Wide scope service systems, such as healthcare, are characterized by a large number of actors and interactions, multilevel structures (from individuals to organizations and national systems) and interdependencies between actors and system levels (Patrício et al., 2020).

When addressing scope in SST, service design can move beyond enhancing dyadic interactions to bringing together and aligning multiple actors' perspectives to co-create shared service system visions (Sangiorgi et al., 2017). To this end, participatory approaches, which are core to service design, become particularly important when designing for scope. By bringing together multiple actors as active co-creators of design solutions (Sanders, 2008), new alternative futures can be collaboratively explored, while the design experts take on the role of facilitators (Patrício et al., 2019). Designing for participation considers how systems are shaped by multiple purposes and worldviews, supporting conversations for collaborative sense-making of what the future system should be (Buchanan, 2015; Manzini, 2015).

Together with a shared vision, service design addressing scope of transformation demands a holistic perspective, involving both the design of single experience elements and their orchestration (Teixeira et al., 2012). This allows for a more integrated approach to service systems that avoids fragmentation and locally optimized transformations that hamper the wellbeing and viability of the system as a whole (Patrício et al., 2020). To this end, service design has developed multilevel approaches to zoom in and out of scope in SST, from designing dyadic touchpoints, to customer journeys across service systems, to integrated services as enablers of value-cocreation interactions among multiple system actors (Patrício et al., 2011; Patrício et al., 2018b). This zooming in and out within multilevel approaches is crucial for the design of the overall service system to be aligned with the transformation of the different sub-systems, enabling integrated co-evolution within and across system components.

While designing for scope of SST can be pursued through the development of shared visions and integrated systems, it can also be fostered through service innovation niches that can be replicated to promote diffusion. To this end, the experimental nature of service design (Karpen et al., 2017) can foster and orient these service system innovation processes, combining small participatory experiments and framework projects (Manzini & Rizzo, 2011), or promoting scalability by nodes, i.e. based on the reproduction of small and local ecosystems (Manzini, 2015; Morelli, 2015).

The hospitality and tourism industry illustrates how service design can support scope of transformation in the face of the immense challenges posed by COVID19, namely through reshaping hygiene and service interaction standards across the industry. To this end, service design participatory approaches involving multiple system actors (e.g. hospitality and transportation; healthcare experts; government and associations) can support and facilitate sense-making by bringing together their multiple perspectives and creating shared visions for the industry as a whole that consider new hygiene and physical distancing measures. This

Table 2
Connecting service design with service system transformation and its analytical dimensions.

Design for SST	Focus of service design	Service design approaches
Overall Transformation	*An action-oriented, human-centered, collaborative approach to creating new service futures*	- Action-orientation toward better futures (Karpen et al., 2017; Patrício et al., 2019; Simon, 1969) - Human-centered approach (Meroni & Sangiorgi, 2011; Yu & Sangiorgi, 2018) - Collaborative design process involving both design experts and broader collectives (Manzini, 2015)
Scope	*From enhancing dyadic service interactions to:* - Collectively creating new shared visions and integrated systems *and* - Creating conditions for diffusion and replication	- Integrating and aligning multiple actors' perspectives through participatory approaches and sensemaking (Buchanan, 2015) - Integrated systems view and multilevel approaches to enable value co-creation interactions within and across service systems (Patrício et al., 2018b; Patrício et al., 2020)
Endurance	*From discrete service design initiatives to:* - Reforming institutions for long-term change *and* - Continuous design, promoting the institutionalization of change	- Experimenting and replicating or scaling-up (Manzini, 2015; Morelli, 2015) - Viewing institutional arrangements as materials of service design (Vink et al., 2021) - Design reflexivity (Meroni & Sangiorgi, 2011) and reformation (Vink et al., 2021) - Extending design in the implementation stage (Norman & Stappers, 2015) - Developing service design capabilities (Karpen et al., 2017) - Changing organizational logics through service design (Kurtmollaiev et al., 2018)
Paradigmatic radicalness	*From designing for incremental change to:* - Challenging fundamental assumptions and beliefs *and* - Visioning and experimenting with radically new futures	- Aesthetic disruption (Wetter-Edman et al., 2018) - Challenging the dominant way of doing and seeing things (Manzini, 2014; Markussen, 2013) - Scenarios to explore future service system change (Manzini, 2015; Meroni & Sangiorgi, 2011) - Speculative design (Dunne & Raby, 2013) and design fiction (Coulton & Lindley, 2017)

shared vision can then orient a roadmap of initiatives toward wider scope of transformation, through integrated design of the interdependent components of the industry service system, zooming in and out along the different levels (individual tourists and employees, organizations, industrial associations, and the tourism system as a whole) so that tourists, employees and other actors can have smooth and coherent value cocreation experiences across the different sub-systems.

In parallel, service design can support niche experimentation of novel types of service interactions in hotels and restaurants revolving around strict hygiene measures, so that they are re-designed around people's preferences, aesthetics, and safety and then subsequently integrate and scale-up to new potential service models. For example, in a large organization with multiple sites or branches (e.g. a hotel chain), SST might be initiated and experimented in a targeted local area and its direct environment with the idea of scaling up after successful trialing of new resource-integrating practices (see e.g., Karpen et al., forthcoming). At the outset, the targeted location or focal subsystem can be selected and set up to increase the chances of successfully rolling out and replicating new resources and practices in related (sub)systems or contexts such as other hotels of a focal chain. In so doing, service design can play a vital role in strategically setting up test environments while planning ahead to increase the scope of SST.

3.3. Service design and endurance of service system transformation

While service design has gradually expanded its scope to enhance dyadic service experiences and address wider business and societal challenges, it has also recognized the importance of enabling endurance of transformation, through reformation of institutions and institutionalization of change. This focus on long-term change implies that institutions, such as enduring rules, norms, and meanings, and their physical enactments become more explicitly considered as central materials that service design interventions aim to shape (Vink et al., 2021). This implies developing service design processes as ongoing and extensive efforts of reflexivity and reformation of institutional arrangements (Sangiorgi, 2011; Vink et al., 2021). Service design processes leverage actors' reflections on their interactions and experiences to become aware of the invisible aspects of existing institutional arrangements, to critique their organizational and social context, and to recognize their mutability (Vink et al., 2021). This reflexivity process of gaining awareness of existing institutional arrangements is required for the conscious introduction of new organizational and design capabilities (Sangiorgi, 2011), and for intentionally reforming institutional arrangements for long-term change (Vink et al., 2021).

To promote endurance of transformation, service design as practiced has also evolved from discrete interventions, to an ongoing and continuous designing process which encompasses the pre-project, during, and post-project phases with the aim of institutionalizing the change (Sangiorgi et al., 2017). This has been reflected in extending the service design role to the implementation stage in order to enhance the probability of success of the planned transformation (Norman & Stappers, 2015). To this end, service design has adopted change management strategies to sustain endurance of transformation efforts, establishing closer designer-client relationships that can affect actors' perspectives and behaviors while facilitating organizational learning (Yu & Sangiorgi, 2018). This long-term view has also led to a refocus from discrete service design initiatives and projects to an ongoing process of developing service design capabilities (Karpen et al., 2017). Instead of merely introducing new service ideas in isolated projects, through the continued practice of designing new value cocreating systems and sociomaterial configurations, service design can assist in enduring transformation of institutional logics (Kurtmollaiev et al., 2018).

In hospitality, work practices are grounded on institutionalized norms and beliefs that prioritize excellent service to customers, thus putting great pressure on employees and creating a vulnerable labor force. This pressure has been significantly exacerbated by the COVID-19

pandemic (Voorhees et al., 2020). With the International Labor Organization's (ILO) right to decent work directly challenged by the recession, and close to 120 million hospitality and tourism jobs at risk (UNWTO, 2020), the pandemic exposed the job insecurity of temporary, migrant, and self-employed hospitality workers (Baum & Hai, 2020).

Service design reflexivity approaches can help unpack the entrenched norms and beliefs that contribute to excellent service to consumers but act as barriers toward fair labor practices and thus foster enduring transformation. By engaging different stakeholders such as employees, customers, and multiple industry actors in co-design processes to gain deeper awareness of these taken-for-granted norms and beliefs, they can acknowledge their mutability and collectively explore how to reform these institutions with new ideas of service excellence with employment stability. For example, offering options ranging from contactless stay to extra or self-cleaning kits allows guests with varying risk profiles to feel safe, thus taking the pressure from the frontline employees. Another such example comes from ILO Carribean which initiated a dialogue between workers' organizations (regular and self-employed), trade unions, employers, and governments about the future of work in the region that was historically reliant on tourism as the leading economic driver (ILO, 2020).

Moreover, service design can contribute to the institutionalization of these new ways of thinking by going beyond specific projects, to an ongoing process of embedding design capabilities and facilitating organizational learning and collaborative negotiation and adjustments of these new organizational models of practice. Instead of conducting isolated projects, using service design as a recurring approach to rethink these taken-for-granted norms and beliefs across organizations and the industry can constitute an opportunity to create the conditions for sustained reformation of these institutional arrangements in hospitality.

3.4. Service design and paradigmatic radicalness of service system transformation

The traditional service design focus on enhancing service interactions has been directed toward incremental change (Bate & Robert, 2007; Clatworthy, 2011), though service experiences do not happen in a vacuum and the actual level of change depends on how deep a design inquiry goes into a service system (Junginger & Sangiorgi, 2009). Designing for higher levels of paradigmatic radicalness of transformation requires evolving service design to enable the disruption of fundamental assumptions and beliefs, and the exploration of radically new service futures. While service design inherently adopts a divergent approach typical of creative processes (Runco & Acar, 2012), the paradigmatic radicalness dimension has only been partly addressed so far. As such, exploring complementarities with other design areas can help fill this void by enriching the set of service design methods and tools to foster this dimension of SST.

Service design for radical transformation involves challenging fundamental assumptions, beliefs, norms, and values that people hold (Rousseau, 1995). Along this line, research has been delving into the potential of service design approaches that challenge mental models in organizations (Vink et al., 2019). For example, aesthetic disruption, intended as "sensory experience that challenges actors' existing assumptions", involves staging situations whereby actors may experience conflict that triggers inquiry, destabilizes habitual actions, and helps them break free of existing beliefs and contribute to system transformation (Wetter-Edman et al., 2018).

Service design work centered on paradigmatic radicalness can also be found in design for social innovation. Here, design can contribute to experimental initiatives aiming to radically change citizens' dominant way of doing and seeing things (e.g. exploring the value of sharing instead of owning things) by operating as facilitator, trigger, co-designer, or activist (Manzini, 2014). Some forms of service design projects and activities utilize contestation strategies of design activism that aim to raise critical awareness and create spaces for alternative

ways of doing through aesthetic means and expressions, e.g. recipes on how to transform dumpsters into playful installations in cities (Markussen, 2013).

Questioning fundamental assumptions and beliefs opens the ground for exploring radically new service system futures. Service design inherently involves a creative and iterative process that opens up new possibilities through the practice of "envisioning", that is, imagining of what might be rather than what is (Karpen et al., 2017), building on iterative and abductive rather than linear processes that may involve problem reframing (Ojasalo et al., 2015). The complexity of service systems leads service design to accept the indeterminacy and emergence, with the aim, not of closure but rather to open up pathways for potential new avenues to unfold (Sangiorgi et al., 2017). This process can be supported by design-orienting scenarios, as communicative artifacts produced to further social conversations (Manzini, 2015). These scenarios can help create, communicate and discuss future visions of what things can be like if certain conditions are fulfilled and what can be achieved, therefore supporting collaborative exploration of new service futures (Manzini, 2015).

Designing for paradigmatic radicalness of transformation can also be informed by design fiction (Coulton & Lindley, 2017) and speculative design (Dunne & Raby, 2013) as ways to understand, imagine, and test new service system futures (Cooper, 2019). Design fiction tries to go beyond designing for probable futures to collaborative world-building, in order to promote engaging conversations about a plurality of possible and preferred futures (Coulton & Lindley, 2017). Furthermore, in speculative design, the idea is not to show how things will happen, but to explore how things can be, to open all sorts of possibilities, and to open up space for collective discussion about preferable futures (Dunne & Raby, 2013).

In the face of the pressing need to radically rethink tourism and sustainability, service design can support the process of disrupting deeply held beliefs and reframing business models to explore radically new service futures. On the one hand, service design approaches grounded on aesthetic disruption and contestation strategies can help challenge fundamental assumptions about travelling, questioning the need for physically experiencing the travel and for the unsustainable use of local resources. These approaches can also promote the exploration of an alternative set of assumptions, beliefs, norms, and values about what constitutes a travel experience at a given destination.

On the other hand, design scenarios and speculative design can also assist in creating disruptive new service ideas and business models, opening radically new sorts of possibilities and supporting collective discussion about preferable futures. For example, the interactive virtual journey through the Great Barrier Reef represents a radically new concept, which can support imagining future scenarios of sustainable tourism and hospitality that can feed conversations with key actors across sectors and inform both top-down interventions and bottom-up experimentations. Disruptive design initiatives can also be promoted as experiments that foster novel ways of consuming at different levels in the population, e.g. by designing alternative forms of hospitality promoting a different idea of "exotic" attractiveness for local and sustainable tourism.

4. Implications and future research directions

With the increasing complexity of the context in which service firms operate, there is a need to better understand how transformations within and among service systems unfold and can be intentionally influenced for better futures (Ostrom et al., 2021, Field et al., 2021). This paper addresses this challenge by providing an integrated, multidimensional conceptualization of SST and applies this conceptualization to articulate how service design can be used to intentionally influence SST toward desired paths. As such, this paper makes several contributions to service research. First, it advances conceptual clarity around SST by providing an integrated conceptualization and definition of SST that builds on the

prior literature. Second, it uses management literature to delineate three analytical dimensions—scope, endurance, and paradigmatic radicalness—that, in combination, help to account for the richness and diversity of SST as a phenomenon. Third, it systematically connects existing service design approaches with these analytical dimensions of SST. All of these contributions are collected together in Fig. 1 and discussed further in the following.

4.1. Theoretical implications

Although scholars are increasingly studying transformation of service systems (Lusch et al., 2016; Wilden et al., 2017), literature has been missing an integrated understanding of SST. By conceptualizing SST as the reconfiguring of both the visible and invisible structures within and among service systems, this paper offers an understanding of SST that stays true to the transcending nature of the concept of service system as a basic abstraction within the systemic perspectives of service research (e.g., Maglio et al., 2009; Vargo & Lusch, 2011) and can accommodate the numerous theoretical perspectives included in the extant literature (see Table 1). Furthermore, the three analytical dimensions of SST delineated in this paper, provide a rigorous framework to account for the richness and diversity of the ongoing or envisioned transformations unfolding within and across service systems (Fig. 1).

Although these three dimensions of SST are interrelated, teasing them out analytically enables seeing how their unnecessary conflation can lead to conceptual confusion in theory development and less impactful practical application. For example, SSTs that are narrower in their scope are often seen as less enduring, while widespread SSTs are often automatically viewed as more enduring (see e.g., Previte & Robertson, 2019; Vargo et al., 2015). Disentangling the dimensions of scope and endurance from one another enables to distinguish between SSTs that spread very fast within and among service systems without becoming persistent (such as trends) from SSTs that are highly institutionalized, but never really widely spread (such as organization-specific practices). Furthermore, by delineating paradigmatic radicalness as a

separate dimension, the conceptualization developed in this paper helps to evaluate whether a reconfiguration maintains the status quo or disrupts it through modifications in the fundamental system of beliefs, assumptions, and ideas that the actors within the service system hold. Conceptually, this highlights that, while the analytical dimensions of SST are interrelated, they are not necessarily moving into the same direction or to the same degree.

However, the synthesis of prior research into an integrated definition and the delineation of analytical dimensions are only the first steps toward a more fully-fledged theory of SST. More work is needed to understand the underlying processes and mechanisms connected with each of the analytical dimension. For example, what other mechanisms and processes than diffusion are connected with the dimension of scope? Literature on co-evolution and collective coordination (e.g., Köhler et al., 2019; Loorbach, 2010) could prove informative for future research endevours regarding this question. In relation to endurance, deepening the understanding of the institutionalization process as well as the mechanisms resulting in increasing isomorphism and legitimacy building (e.g., Boxenbaum & Jonsson, 2017; Verleye et al., 2019) can offer fruitful future research opportunities. Future studies should also consider drawing, for example, from the study of distruptive innovation (e.g., Wessel & Christensen, 2012) in further examining the paradigmatic radicalness dimension of SSTs. Beyond this, the question remains whether additional dimensions exist and how the three dimensions delineated here relate to each other. Future research should also examine to what degree these dimensions mutually influence each other during SST and consider developing measurement or mapping tools for them.

This integrated conceptualization highlights that each SST involves a (unique) combination of multiple dimensions. As such, a systematized understanding of how actors can intentionally initiate or influence ongoing SST in these different dimensions is needed. This paper builds upon and contributes to recent service design efforts focused on distinct dimensions of SST such as endurance (Vink et al., 2021, Karpen et al., 2017) and scope (Patrício et al., 2018b), by integrating them with
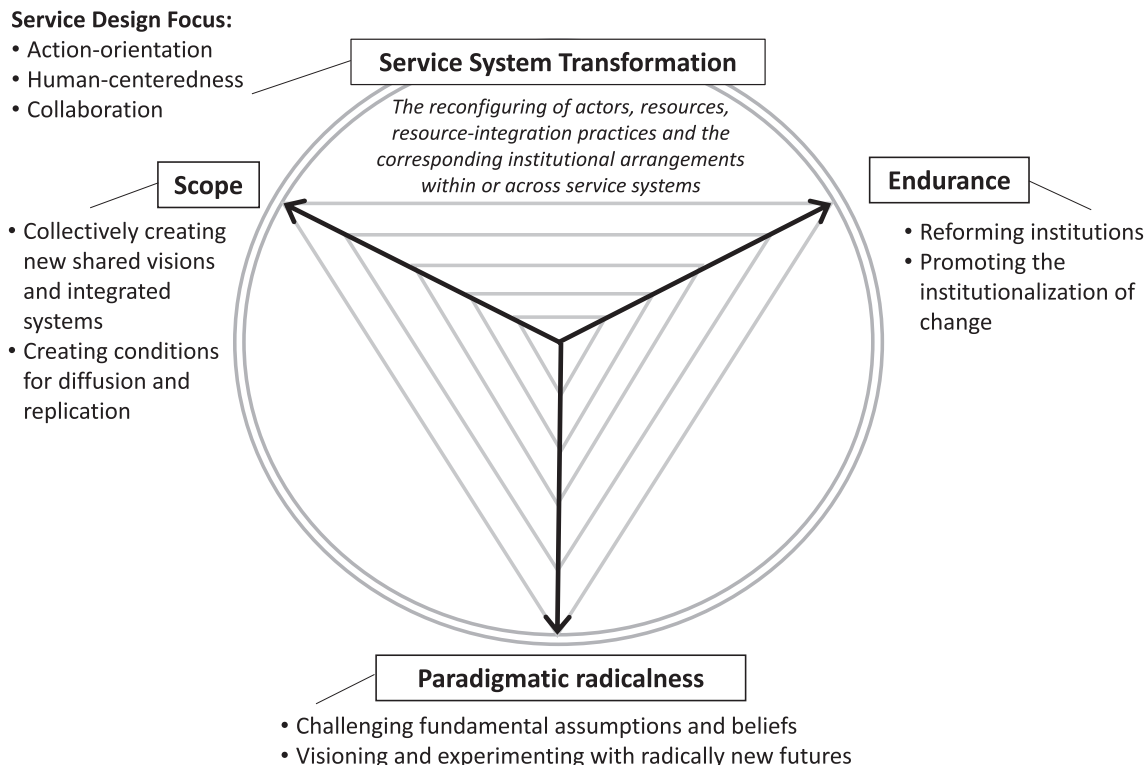

Service Design Focus:
- Action-orientation
- Human-centeredness
- Collaboration

Service System Transformation

The reconfiguring of actors, resources, resource-integration practices and the corresponding institutional arrangements within or across service systems

Scope
- Collectively creating new shared visions and integrated systems
- Creating conditions for diffusion and replication

Endurance
- Reforming institutions
- Promoting the institutionalization of change

Paradigmatic radicalness
- Challenging fundamental assumptions and beliefs
- Visioning and experimenting with radically new futures

Fig. 1. Analytical dimensions of service system transformation and their connection to service design focuses.

corresponding service design literature to develop a systematized understanding of how service design can foster SST in its multiple dimensions. By delineating different design approaches that can address the full range of SST, especially higher levels of each SST dimension, this systematization also advances the understanding of service design as a transformative approach beyond incremental improvements of dyadic interactions.

As visualized in Fig. 1, the analytical dimensions of SST can be used as a "radar chart" to clarify the more specific nature of the existing or envisioned transformations in terms of their scope, endurance, and paradigmatic radicalness. By identifying service design approaches that may be particularly suited to address each of the analytical dimensions of SST, this paper provides a map of approaches that service design researchers and practitioners can navigate and use to purposefully address specific transformation challenges. For example, when service designers aim at changing the ingrained norms and work practices in hospitality contexts toward more enduring transformation, service design's reflexivity approaches can be particularly effective to raise awareness and acknowledge the mutability of such structures. Future research can therefore explore and expand this range of service design approaches and empirically study how they can enable SST for each dimension. More generally, this map provides an integrated and systematic framework for understanding transformation, which could inform other domains of research studying intentional, actor-driven changes. For example, future research may look into applying this framework to conceptualizing the market- or system-level transformations that might emerge as a consequence of market-shaping (e.g., Nenonen et al., 2019).

On the other hand, by exploring how service design can simultaneously influence the different dimensions, this research opens many possible pathways to purposefully foster SST in a more nuanced way. For example, due to the concerns raised by COVID-19, the entire hospitality and tourism industry needed to respond with a wide scope of transformation toward adopting stricter hygiene and social distancing measures that crosscut the multiple system components, from hospitality, to transportation and leisure. However, only the future will tell whether this transformation will endure. Organizations and other system actors may use service design to foster widespread and integrated adoption of hygiene measures, while purposefully maintaining flexibility so that the physical proximity and empathy that the hospitality industry value may be restored after the pandemic. Alternatively, COVID-19 can be seen as an opportunity to challenge current tourism "growth-paradigms and assumptions that have led to the current situation and enable us to reimagine and reset tourism" (Sigala, 2020, p. 314). From this perspective, service design may leverage design fiction and scenarios to explore radically new concepts such as the virtual barrier reef tour, although it may be prudent to maintain a narrow scope of transformation while running these experiments, until the new concepts are successfully tested and can be diffused. Exploring how service design approaches can be combined to enable a diversity of multidimensional SST processes offers relevant and impactful avenues for future research and practice.

Finally, while systematizing how service design can foster each dimension of SST is an important step, designing for a combination of high levels of the scope, endurance, and paradigmatic radicalness may require new service design approaches and novel ways to integrate them. Such SSTs are related to multidimensional and multilevel co-evolution processes, such as the transition to decarbonized energy systems, involving profound and enduring interdependent developments in a range of system elements such as technologies, markets, user practices, infrastructures, policies, among others (Köhler et al., 2019). Multidisciplinary bridges are needed to support the expansion of service design to address these new challenges. For example, wide scope, long-lasting and paradigmatic change has been introduced in different but interrelated fields of design and systems research, such as transition management (Loorbach, 2010) or transition design (Ceschin & Gaziulusoy, 2016). All of these contributions adopt a long-term vision with the goal

of accomplishing paradigmatic change in broad socio-technical systems through the use of multilevel, multi-actor, and multidisciplinary approaches. Exploring the connections between service design and these other areas related to SST opens up relevant ideas for future research. Overall, this paper sets the ground for advancing service design's transformative role in multiple ways, from a focused approach to each dimension, to a combined approach for enabling multidimensional and more nuanced forms of transformation, and to an

integrative and multidisciplinary approach to foster SST to address broader societal and human system problems.

4.2. Managerial implications

For managers, the multidimensional nature of SST and connected service design approaches can be highly influential insights in the process of making sense and addressing the complex context in which they operate. The first step in this sense-making process is to use the analytical dimensions to evaluate the more nuanced nature of the focal, ongoing or envisioned, SST. To facilitate this, Fig. 2 includes example questions that can be asked in relation to each analytical dimension, helping practitioners to clarify 1) what kind of a SST they are dealing with and 2) what their intentions regarding the SST are. Fig. 2 also collects the available service design approaches for influencing the SST depending on the dimensions it is characterized by.

While the analytical dimensions of SST can be related, they do not necessarily need to be addressed at the same time, nor with the same magnitude. For example, practitioners might purposefully focus on and initiate a reconfiguration along one particular dimension. This 'narrow' focus might become meaningful or even necessary if there are particular dynamics at play that either need to be challenged in order to allow for system transformation (e.g., specific barriers) or if there is momentum for a particular dimension given local circumstances (e.g., specific enablers). To illustrate, SST might hinge on overturning existing beliefs or assumptions, as a critical starting point of paradigmatic radicalness before scope or endurance may become relevant. Alternatively, the complexity of a service system might require local action and for people to experience new resource-integration practices more widely spreading and/or over time, before an openness to changing existing beliefs might emerge. The three analytical dimensions of a focal SST might, thus, change concurrently or consecutively depending on contextual dynamics and service design decisions.

We further elaborate how managers may operationalize the sense-making process described in Fig. 2 through two examples from the hospitality and tourism sector referred earlier in the paper (see also Web Appendices A and B for graphical illustrations). The richness and diversity of the reconfiguration that can unfold within and among service systems means that it is difficult to come up with a business playbook for SST. However, the multidimensional "radar chart" of SST and the articulation of connected service design approaches equip managers with both the analytic tools to ask the right questions at critical junctures and the design tools to envision and explore potential paths to desired futures. For example, the thought experiment on urban mobility (Web Appendix A) illustrates how despite its early growth spurts, e-scooters faced growing pains due to issues with other elements in the broader service ecosystem such as the use of public space. Investigation of the focal service system would help managers see the limitations of the initial scope that involved primarily technology start-ups as participating actors. Design efforts could intentionally involved broader collectives to enhance the scope of the SST as well as explore ways to effect enduring changes by institutionalizing new patterns and rules of urban mobility. A radically different and better future may then be ushered in through designing efforts that challenge the fundamental assumptions and beliefs regarding mobility in urban settings.

Similarly, the thought experiment on virtual tourism (Web Appendix B) exemplifies how a paradigmatically radical transformation born out of unusual circumstance may expand in scope and/or endurance over
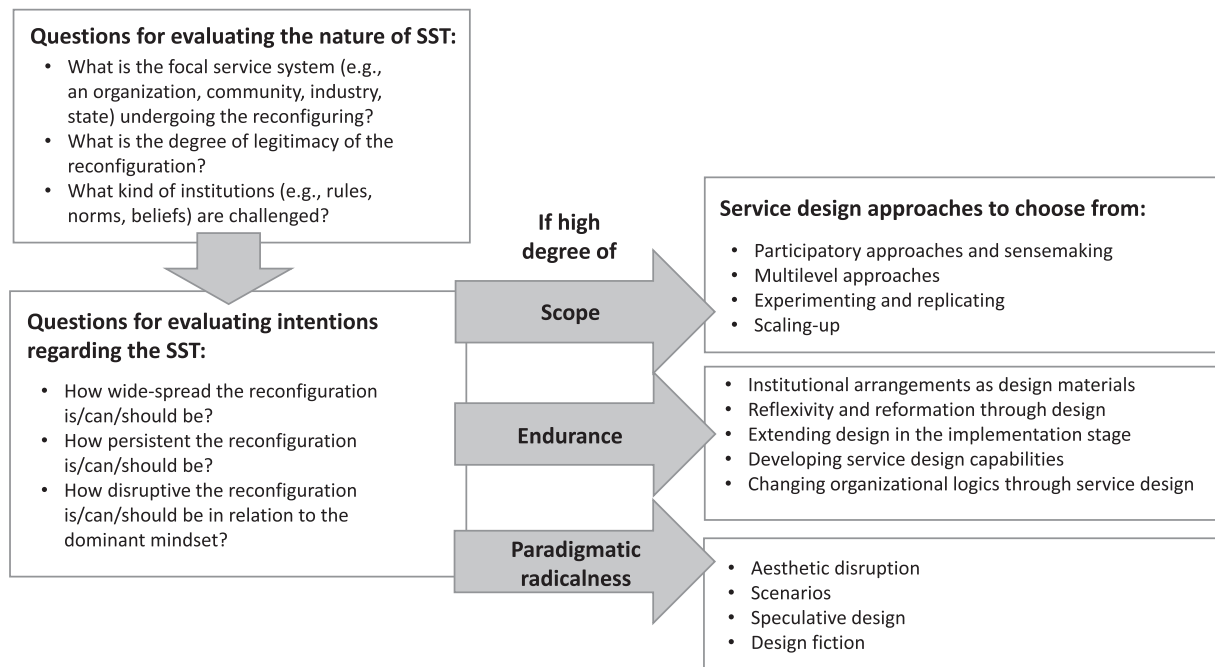
Fig. 2. Managerial questions related to SST and available service design approaches.

time. It is important to note that the paths charted in the Web Appendices represent potential scenarios. For example, the memorable experience delivered by the Great Barrier Reef virtual tour could energize multiple actors in the service system to reflect on the success and further experiment with immersive virtual technologies toward broader adoption, while other destinations such as Amsterdam may use legal measures to institutionalize desired changes. The sense-making process depicted in Fig. 2 facilates the envisioning of such pathways by enabling a better understanding of the potentially unique nature of the focal SST and the service design methods available for influencing it.

5. Conclusions

There is an increasing recognition that service systems of all sizes are constantly reconfiguring themselves. In this paper, we have started a more integrative journey of making sense of such transformations within and among service systems by synthesizing prior literature to create conceptual clarity around SST and systematically connecting service design approaches with the analytical dimensions of SST. We hope that these efforts pave the way to impactful future research on SST that realizes on the transformative potential of service design as the world works to find its balance amid the ongoing turbulences and embraces itself for the future in which the only constant is change.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

Web Appendices A and B. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jbusres.2021.07.034.

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