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Leveraging service design for healthcare transformation

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**Leveraging Service Design for Healthcare Transformation:
Toward People-Centered, Integrated, and Technology-
Enabled Healthcare Systems**

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Leveraging Service Design for Healthcare Transformation: Toward People-Centered, Integrated, and Technology-Enabled Healthcare Systems

Abstract

Purpose: This paper explores how service design can contribute to the evolution of health service systems, moving them toward people-centered, integrated, and technology-enabled care; the paper develops a research agenda to leverage service design research for healthcare transformation.

Methodology/Approach: This conceptual study starts by analyzing healthcare challenges in terms of demographic trends and economic constraints, along with the problems of lack of people-centricity, dispersion of care, and slowness in incorporating emerging technologies. Then, it examines the theoretical underpinnings of service design to develop a framework for exploring how a human-centered, transformative, and service systems approach can contribute to addressing healthcare challenges, with illustrative cases of service design research in healthcare being given.

Findings: The proposed framework explores how a human-centered service design approach can leverage the potential of technology and advance healthcare systems toward people-centered care; how a transformative service design approach can go beyond explanatory research of healthcare phenomena to develop innovative solutions for healthcare change and wellbeing; and how a service systems perspective can address the complexity of healthcare systems, hence moving toward integrated care.

Originality: This paper systematizes and develops a framework for how service design can contribute to healthcare transformation. It identifies key healthcare application areas for future service design research and pathways for advancing service design in healthcare by using new interdisciplinary bridges, methodological developments, and theoretical foundations.

Keywords: Service design; service system transformation; healthcare service; people-centered care; integrated care; technology-enabled service.

Introduction

Healthcare is an immensely expensive, complex, and critical service that significantly affects economies worldwide, not to mention the quality of people's daily lives (Berry and Bendapudi, 2007). Healthcare touches virtually everyone at some point in their life and is the backbone of individual and societal wellbeing (Danaher and Gallan, 2016). The vision of healthcare has evolved toward a more people-centered and integrated care system and ensures that they receive a continuum of healthcare throughout their lives (WHO, 2016). However, making this vision come true requires understanding healthcare challenges and undertaking profound transformations in the health system. The increasing number of elderly individuals and high healthcare costs have become the primary reasons for the increased pressure on healthcare systems. The evolution toward people-centered and integrated care has been hampered by traditional practices that view patients as passive receivers of healthcare and by a system that is fragmented and increasingly complex (Lee and Hall, 2010). Additionally, emerging technologies and data offer immense opportunities for healthcare, but the potential of new technology and data solutions remains largely unfulfilled (Kellermann and Jones, 2013). To make the necessary transformation toward a new vision of healthcare, it is important to rethink and redesign health service systems to leverage technology and empower people in cocreating their health.

Service design can contribute toward healthcare transformation by providing a human-centered, holistic, and iterative approach to the creation of new services (Blomkvist et al., 2010). By understanding human experiences and translating this understanding in the design of new service futures (Sangiorgi et al., 2019b), as well as by actively engaging people in transformation processes through participatory design approaches (Meroni and Sangiorgi, 2011), service design has adopted a human-centered approach from its start. Service design takes a creative and transformative approach to envisioning new futures, coupling this with a

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3 holistic service systems perspective; hence, it provides an integrative approach for innovating
4 complex healthcare systems and design for social change (Sangiorgi et al., 2017).
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8 Therefore, service design offers promising contributions to catalyze health system
9 transformation toward a new vision of care. Exemplar applications of service design in
10 healthcare contexts include the creative exploration of social robots roles for the cocreation of
11 elderly care (Čaić et al., 2018) or the use of service design to change ingrained norms and
12 beliefs in mental health services (Vink et al., 2019). For example, service design has been
13 applied to establish three physical colabs in the Lombardy region in Italy. Engaging patients,
14 relatives, professionals, associations, and local actors, service design has supported a codesign
15 effort to collaboratively envision how these labs could promote a more community-based and
16 cocreated form of mental healthcare. Despite these scattered instances of service design
17 applications in healthcare systems, the role of service design in healthcare transformation
18 remains largely uncharted; indeed, service design has been mostly focused on studying
19 incremental change and experience-based design initiatives. To explore how service design can
20 achieve its full potential, it is important to develop a more structured and systemic
21 understanding of healthcare challenges and of how service design can contribute toward
22 overcoming the barriers that hamper obtaining this new vision of healthcare.
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42 The current paper develops a framework and research agenda to leverage service design
43 to evolve toward a new vision of healthcare. Building on the examination of healthcare
44 challenges and service design's theoretical underpinnings and approaches, the present paper
45 first reveals how a human-centered and participatory approach can leverage technology and
46 move healthcare systems toward providing people-centered care. Second, the present paper
47 highlights how a creative and transformative service design approach can go beyond
48 explanatory research of healthcare phenomena to develop innovative solutions that foster the
49 change of enduring norms, roles, and beliefs for healthcare transformation. Finally, the current
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3 study shows how a service systems' perspective can contribute toward integrated healthcare
4 systems by understanding the needs of healthcare actors and by developing integrated services
5 that balance conflicts between different actors and different health ecosystem levels.
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10 The current paper starts by examining healthcare challenges, which is followed by
11 examining the vision of people-centered, integrated, and technology-enabled care. Then, the
12 present paper examines the human-centered, transformative, and service systems approaches
13 of service design and how they can tackle healthcare challenges; this is done by providing
14 illustrative cases based on previous research. The last section develops a research agenda that
15 shows how service design can realize its potential for healthcare transformation.
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25 **Healthcare service system challenges**

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27 Healthcare services are currently undergoing dramatic changes. This section examines some
28 key demographic and economic challenges, as well as healthcare system areas in need of
29 profound transformations.
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34 *Demographic shifts*

35 Changing demographics worldwide are putting pressures on healthcare systems (WHO, 2016).
36 One of the most significant concerns is an increasing elderly population (European
37 Commission, 2018; United Nations, 2019). At the same time, by 2030, it is estimated that 65
38 percent of the global population will be middle class (Kharas, 2017). These demographic shifts
39 entail a change in health-related needs, with an increased prevalence of chronic diseases,
40 mental health concerns, and obesity, among others (Deloitte, 2019). Increased migration and
41 the presence of more diverse ethnic groups in some regions can also contribute to stress on
42 healthcare providers not accustomed to addressing this diversity (Ahmed and Foster, 2010).
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54 *Economic constraints*

55 Healthcare spending is expected to continue growing at a staggering rate, and this may not be
56 because of higher healthcare utilization but rather because of the increase in administrative and
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3 professional prices (Papanicolas et al., 2018; Pozen and Cutler, 2010). The reasons for these
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5 burgeoning healthcare costs include greater pharmaceutical spending and elevated salaries for
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7 physicians and nurses (Papanicolas et al., 2018); they also include administrative issues,
8
9 namely inadequate knowledge regarding what costs will be covered by various complex
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11 reimbursement structures, and, most importantly, an inability to relate the costs of care to
12
13 efficiency in the outcomes achieved (Kaplan and Porter, 2011). This situation has led to a push
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15 for healthcare systems to embrace a “value agenda” that is transparently focused on
16
17 maximizing the cost-effectiveness of healthcare services (Porter and Lee, 2013). However,
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19 such a change to a value-driven healthcare system requires a sweeping transformation in the
20
21 mindset of many healthcare actors to promote policy and procedural changes.
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26 27 *The lack of people-centered care*

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29 Traditionally, healthcare has focused on curing illnesses (i.e., *what is the matter with the*
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31 *patient*) (Deloitte, 2019). This approach was “repair-focused.” However, people-centered
32
33 healthcare (WHO, 2009) implies going beyond curing illnesses toward considering and caring
34
35 for other aspects of a person’s wellbeing (i.e., *what matters to a person*, e.g., a person’s
36
37 physical, cognitive, emotional, and contextual aspects). Although healthcare systems across
38
39 the globe strive to achieve people-centered care, realizing this holistic approach has been
40
41 hindered by numerous barriers. According to Sinaiko et al. (2019), the main barriers include i)
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43 missing information and ways to collect it; ii) inadequate trust, respect, and trustworthy
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45 exchange of information; iii) organizational culture, along with clinicians’ training,
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47 demographics, and beliefs; and iv) the alignment of incentives and other factors from the
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49 external environment. These barriers call for a redesign of contemporary healthcare systems to
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51 allow for closer collaborations between healthcare beneficiaries and healthcare professionals.
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Fragmentation in healthcare delivery

Service providers in healthcare industries have become increasingly fragmented into a bewildering array of subspecialties, external laboratories, insurance plan providers, and competing practices. As an extreme example of this trend, one of the main challenges in the US is the maze-like range of differing insurance plans coupled with the variations in costs for care and procedures. Advances in medicine that enhance the ability to carry out complex, intricate healthcare procedures can also lead to larger medical teams and more complicated workflows (Barjis, 2011). As a result, a serious problem in current healthcare systems is the potential for breakdowns in communication or coordination between the various units involved in treating a patient. The misalignment of incentives among various medical providers can also contribute to an inefficient allocation of resources, resulting in less-efficient medical care (Enthoven, 2009). Conscientious medical providers have responded to this situation with a call for more integrated practice units, but this approach has yet to be adopted in a widespread manner because of the current structural barriers that incentivize a fragmented and multisite model (Hwang et al., 2013).

Technological paradigm shifts

The information era has resulted in the rise of new kinds of healthcare services that can improve record keeping and better integrate patient data across multiple providers; this has the potential to contribute to a more effective, personalized, and patient-centric approach to healthcare (Beirão et al., 2017; Bolton et al., 2018; Pinho et al., 2014). Additional emerging technologies are likely to take this process even further, leading toward new applications of artificial intelligence and machine learning for diagnostic purposes, along with robotic medical assistants, virtual reality medical visualization systems, online healthcare, and a whole slate of similar products (Deloitte, 2019). In the most ideal case, these advances will improve the provision of services, alleviating some stress on healthcare professionals (Čaić et al., 2018;

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3 Safavi and Dare, 2018). However, the introduction of new technology does not come without
4
5 its risks or challenges. Automatization can feel alienating to patients, and it raises issues of
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7 control, safety, privacy, and transparency (e.g., who has access to the data gathered by such
8
9 technologies?). Therefore, emerging technologies and data offer immense opportunities for
10
11 healthcare, but the potential of new technology and data solutions remains largely unfulfilled
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13 (Kellermann and Jones, 2013).
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16 17 18 **Toward a Vision of People-Centered, Integrated, and** 19 20 **Technology-Enabled Healthcare** 21

22 The vision of healthcare has evolved toward people-centered, integrated health service systems
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24 (WHO, 2016). People-centered health services is, at its core, putting people and communities
25
26 at the center of health systems and empowering people to take charge of their own health
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28 instead of being passive recipients of care. This means that a person cannot be reduced to a
29
30 disease, and he or she has the capabilities and knowledge to manage his or her own health. At
31
32 the same time, health professionals should seek to develop a relationship based on the respect
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34 of equals (Wigzell, 2017), resolving the dual-sided information asymmetry: the provider
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36 (physician) brings technical (clinical) knowledge, and the customer (patient) brings personal
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38 knowledge (Black and Gallan, 2015).
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43 Integrated health service systems should ensure that people receive a continuum of
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45 health promotion, diagnosis, treatment, rehabilitation, and palliative care services across the
46
47 different levels and sites of care for their entire lives (WHO, 2016). This demands a dramatic
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49 shift from the current practice of addressing problems after they have occurred and treating a
50
51 patient's illness to promote wellbeing across the person's life and population health
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53 management (Kizer, 2015). Integrated health also requires fighting system fragmentation and
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55 promoting coordination and collaboration within the network of healthcare actors (Danaher
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57 and Gallan, 2016), as well as balancing individual and organizational needs with societal
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3 wellbeing and healthcare system viability (Beirão et al., 2017). To this end, the creation of
4 integrated practice units has been advocated as a way to provide the full cycle of care for a
5 medical condition (Van Harten, 2018). However, although the formation of these units has
6 occurred sporadically, integrated care has yet to be widely adopted given the multisite
7 healthcare delivery organizational system and the lack of nationwide integrated care delivery
8 systems (Porter et al., 2013).
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11 Finally, technology offers immense opportunities to enable people-centered, integrated
12 care, which demands connected, intelligent information systems with adequate user interfaces.
13 Patient-related technologies such as health apps, wearables, social robots, connected implants,
14 or online support communities offer accessible and efficient services that augment – or even
15 replace – existing interactions with formal and informal healthcare providers. At the same time,
16 technology facilitates collaboration among the stakeholders of the ecosystems, such as patients,
17 professionals, insurances, hospitals, pharmacies, drug companies, policy makers, and families
18 (Pinho et al., 2014). Real-time data exchange between back- and front-office systems,
19 predictive data analytics, and (semi)automated decision-making systems can pave the way to
20 novel, more accessible, and more affordable healthcare services.
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24 Moving toward this vision of healthcare requires a profound health system
25 transformation. Therefore, healthcare has been considered a relevant, impactful sector in need
26 of urgent service innovation and also an area with high potential for academics to make
27 significant research and societal contributions within (Berry and Bendapudi, 2007; Berry,
28 2019). This has stimulated a growing body of healthcare service research, but most of the
29 literature has focused on explaining healthcare phenomena, with an emphasis on patient
30 experiences and value cocreation. Although this understanding is crucial, evolving toward this
31 vision of healthcare requires complementing explanatory research with more action-oriented
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3 approaches, such as service design, to create new service innovations that promote the desired
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5 transformation in health service systems (Patrício et al., 2019).
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9 **Leveraging Service Design for Healthcare Transformation**

10 Service design can catalyze transformation toward new healthcare, but a deeper understanding
11 is needed regarding how this can be realized. This section examines three key complementary
12 and mutually reinforcing service design approaches and how, together, they can boost health
13 system transformation toward the new vision of healthcare, as depicted in Figure 1. These
14 approaches are a human-centered and participatory design approach to collectively create new
15 services based on a deep dive into people's experiences; a creative and transformative approach
16 that can help envision a move toward improved patient wellbeing; and a service systems
17 approach for developing solutions that balance the different goals of multiple healthcare actors
18 and pursue individual, organizational, and societal wellbeing. These approaches are illustrated
19 with examples of research projects that have contributed to both promoting healthcare
20 transformation and advancing service design research.
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39 *Service design: a human-centered and participatory approach*

40 Service design adopted a human-centered approach from its start, focusing on understanding
41 human experiences and translating this understanding into a design of better customer journeys
42 (Sangiorgi, 2009). Overall, service design offers deep qualitative insights into individual
43 unique experiences, supporting the generation of service concepts that are inspired by the user's
44 contextual and holistic experiences (Yu and Sangiorgi, 2018). Service design develops
45 empathic knowledge by having direct contact with users and their contexts; this is facilitated
46 by the application of design ethnography approaches (Blomberg et al., 1993), such as
47 contextual interviews (Holtzblatt and Beyer, 2017) or empathy probes (Mattelmäki, 2005).
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3 Empathy is fundamental for developing solutions that are closer to people's needs and abilities,
4 supporting organizations to adopt an outside-in perspective in their innovation processes.
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8 The fundamental role of people in services has also motivated the application of
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10 collaborative design approaches and methods, here originating from the field of participatory
11 design (Greenbaum and Kyno, 1991; Schuler and Namioka, 1993). Participatory design is an
12 evolving area of research and practice exploring effective modes that enable user participation
13 during a design process. Based on this, service designers have been playing a facilitation role
14 within codesign workshops (Trischler et al., 2018). Apart from reflecting on the cocreated
15 nature of service, the engagement of people in codesign processes is also associated with
16 empowerment and emancipation aims, favoring self-reflection and stimulating hope and
17 imagination for the future (Sangiorgi, 2011). These dual dimensions of understanding and
18 engaging people in the design for better service experiences are what qualifies the human-
19 centeredness of service design (Meroni and Sangiorgi, 2011).
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33 To redesign healthcare, there is a need for more consumer engagement and
34 collaborative patient-provider relationships (Anderson et al., 2018). By bringing empathy and
35 the study of human experiences to the fore, service design complements the original focus on
36 the processes, pathways, and systems found in healthcare improvement studies (Bate and
37 Robert., 2007). By applying an experience-based approach, service design focuses on the role
38 of emotions in healthcare recovery (Stacey and Tether, 2015); this helps healthcare staff and
39 organizations empathize with patients and design services around their experiences, which is
40 fundamental for imagining and implementing people-centered care (Tsianakas et al., 2012).
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51 Furthermore, service design has also contributed toward developing more inclusive,
52 efficient, and integrated care (Fisk et al., 2018). Service design approaches and solutions have
53 proved effective in engaging and codesigning with people who have different forms of
54 disabilities and vulnerabilities, such as elderly people (Kälviäinen and Morelli, 2013), people
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3 with cognitive impairments (Carr, 2018), or those with mental health concerns (Sangiorgi et
4 al., 2019a). Previous studies show that codesign is particularly relevant in healthcare contexts
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6 where the patients are in a vulnerable position and may not perceive themselves as suitable
7
8 participants (Hurley et al., 2018). In general, patient engagement is highly valued in healthcare
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10 because it contributes to better health outcomes (Barello et al., 2012). Codesign approaches
11
12 contribute to but also go beyond patient engagement, involving users in the design and delivery
13
14 of their service (Boyle & Harris, 2009), mobilizing their hidden resources for better healthcare
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16 (Palumbo, 2016).
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22 *Codesigning mental health services: Recovery.Net project in Italy*

23 Recovery.Net is an Italian project funded by Fondazione Cariplo; its aim is to transform mental
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25 healthcare service systems toward community-based psychiatry, here intended as an integrated
26
27 care system cocreated among different actors. This project is an example of people-centered
28
29 and integrated care because Recovery.Net's recovery orientation toward mental healthcare
30
31 challenges traditional patient–clinician roles and interactions (Phillips et al., 2012). This project
32
33 also balances institutional care with community-based support programs. To this end, it brings
34
35 together the traditional biomedical model, which is based on interventions to overcome or
36
37 reduce symptoms and disabilities, along with a recovery vision that gives increased importance
38
39 to people's assets, choices, and capabilities (Anthony, 1993). This is complemented by
40
41 community-based psychiatry, which values individual and territorial resources to support
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43 rehabilitation paths, social inclusion, and stigma reduction. These community resources are
44
45 fundamental for patients' recovery journeys and also contribute to the establishment of a
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47 renewed idea of mental health as valuable for all society.
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54 Service design has been involved in the project by facilitating collaborative design
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56 processes to establish innovation colabs in the project's three territories in the Lombardy region
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58 (Brescia, Mantova, and Castiglione delle Stiviere). These colabs aim to be the engines of this
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3 transformation, involving the codesign process with patients, relatives, professionals,
4 associations, and local actors. These three physical and social labs have been imagined as
5 places where people meet in an equal manner to cocreate new forms of knowledge (e.g.,
6 Recovery College), initiatives (e.g., thematic readings, theater), and encounters (e.g., job
7 placement support programs). Service design has focused on supporting this collaborative
8 process, starting from the experience of patients and their relatives, considering people as
9 resources and patients as experts in their recovery journeys. In these colabs, service design
10 untaps the participants' ability to reconfigure existing resources to enhance their recovery
11 journeys and to gradually transform the mental healthcare ecosystem (Vargo et al., 2015).
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23 24 *Service design: a creative and transformative approach*

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26 Service design's key purpose is to enable change toward a better future. Although steering
27 firms and users from "existing situations into preferred ones" (Simon, 1969) has been at the
28 core of design for a long time, the environment in which this takes place has changed. Instead
29 of relatively stable and predictable environments, today's rapid economic, political, and
30 technological developments prevent future states from being so easily prescribed and planned
31 (Dadich and Doloswala, 2018; Orlikowski, 1996). Service design's creative, visual, and
32 transformative approach can help envisioning new futures in the changing environment of
33 healthcare.
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45 A creative approach inherent to service design assists in finding novel approaches to
46 people-centered care and how technology can act as an enabler of this. Service design involves
47 creative problem solving by taking a process perspective when it comes to creativity. Rather
48 than describing the creative output or idea, service design aims at creating novel and useful
49 ideas for different domains (Amabile et al., 1996). The creative cooperation between health
50 service providers and the user is fertile ground for future health services (Steen et al., 2011).
51 Patients, nurses, family, medical specialists, and other actors of the healthcare ecosystem
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3 contribute their knowledge and experience to understanding the service needs and developing
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5 new ideas.
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8 Viewing people as a major source for innovation has been at the heart of more recent
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10 organizational change theories (e.g., situated change theory), which explain why people
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12 improvise and innovate and which have motivated modern working forms such as agile teams,
13
14 holacracy, or crowdsourcing (Mahr et al., 2015). However, the sensitivity, criticality, and
15
16 abstractness of issues in healthcare demand adequate ways to obtain reliable input and ideas.
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18 A visual approach offers an important way to communicate and gain an understanding of the
19
20 world (Bell and Davison, 2013) and to elicit latent needs and envision new future ideas.
21
22 Emphasizing the collection, processing, and articulation of visual information also
23
24 accommodates the involvement of diverse users (Childers et al., 1985). The active involvement
25
26 of healthcare actors in the service design process also demands an iterative try out and
27
28 validation of preliminary, potentially error-prone services. This action-oriented approach, as
29
30 opposed to an explanatory one (Patricio et al., 2019), manifests in continuous learning loops
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32 of experiencing a prototype, reflecting on the experience, interpreting the feedback and
33
34 devising a new experience prototype for developing future services (Kolb, 1984).
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40 Service design also acknowledges the complexity of human nature, aiming here at
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42 reaching more ambitious goals. Instead of developing single services driving traditional
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44 outcomes (e.g., satisfaction, loyalty), service design has increasingly focused on transforming
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46 organizational practices and institutional logics (Kurtmollaiev et al., 2018), as well as on
47
48 improving wellbeing and promoting social change (Alkire (née Nasr) et al., 2020). The
49
50 transformative role of service design enables the development of future healthcare systems that
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52 reconsider existing industry logics while aiming for far-reaching goals for the patient and the
53
54 environment. Therefore, service design has been considered an essential mindset and tool for
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56 transformative service research in healthcare (Anderson et al., 2018).
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Envisioning robotic care through service design

Funded by the EU's Horizon 2020, this project aimed to tackle the challenges of aging populations by introducing an affordable robotic carer for elderly people. Robotic healthcare assistants (e.g., avatar nurses, care robots) have been commonly seen as a potential solution to address the lack of elderly care professionals, enhance the wellbeing of the elderly, and reduce the caregiving burden of formal (professional) and informal (family and friends) caregivers (Robinson et al., 2014). The main goal of this project was to develop a robotic carer that can connect the elderly to a virtual care network, personalize its behavior to the needs of seniors, and support the elderly's daily tasks, ensuring their wellbeing and safety.

First, the project leveraged a service design creative approach to get the elderly discussing sensitive topics of care, isolation, independence, and privacy, but also to make abstract concepts such as virtual networks and robots more understandable and relatable. The researchers conducted in-depth interviews with the elderly, employing a game-like, generative card activity, that is, contextual value network mapping (Čaić et al., 2018). By mapping out their care networks using cards labeled "my daughter" or "my physician," the elderly created a visual materialization (Banks, 2001; Sanders and Stappers, 2008) of their conceptualization of *care networks* and shared their current care experiences. For each care network, the project also leveraged the expertise of other identified network actors – both formal and informal caregivers. This collective creative process, which builds on the participation and resourcefulness of individuals, illuminated the informants' anticipations of the robot's cocreation/codestruction potential (Čaić et al., 2018).

Second, the employed research approach did not focus only on the descriptive elements of *status quo* care-based networks, but also on the envisioned *future scenarios* of robotized care. For example, the informants shared the ways in which their worries of robotized care could be alleviated through functional modifications (e.g., adding elements of physical assistance to the current robot prototype), promotion of high-tech and high-touch elderly care

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3 (e.g., not using robots to substitute invaluable human contact and emotional support), and
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5 ensuring transparent data management (e.g., clearly defined levels of access to data collected
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7 by the robot).
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10 Third, this research project considered ways to create transformative changes in the
11 lives of not only the elderly, but also their formal and informal care providers. Through the
12 network mapping activity, the informants were triggered to holistically reimagine future elderly
13 care and redefine the institutionalized value cocreation practices, roles, and rules. The
14 informants thoroughly discussed whether the benefits of having the care robot might outweigh
15 the costs. For example, the uncovered robot roles were found to both promote – but also hinder
16 – the achievement of health-related outcomes, while the unintended consequences for
17 wellbeing were detected both on the individual (e.g., decline of agency, loss of privacy,
18 delusion) and collective (e.g., technology dependence, data sharing and management, lack of
19 personalized care) levels.
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33 *Service design: a service systems approach*

34 Service design has evolved to address the increasing complexity of service systems. Although
35 initially focused on enhancing dyadic interactions between customers and service providers
36 (Sangiorgi, 2009), service design has increasingly adopted a service systems approach to
37 design services as enablers of value cocreating interactions in value networks and service
38 ecosystems (Sangiorgi et al., 2017). This approach can be particularly useful in addressing
39 complex healthcare systems, which involve a wide range of actors, have conditions that the
40 public finds undesirable, and demand intervention by policy makers (Trischler and Charles,
41 2019).
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54 Service design has strengthened its service systems approach by combining a service
55 perspective with systems thinking. A service perspective grounded in service-dominant (S-D)
56 logic (Vargo et al., 2008) brings the focus to understanding how actors integrate resources to
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3 develop new value propositions to enable value cocreation among them (Frow et al., 2014).
4
5 This is important for people-centered care because service design approaches healthcare
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7 services as enablers of value cocreation between patient networks and healthcare provider
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9 networks, empowering patients as active cocreators of their health (McColl-Kennedy et al.,
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11 2012).
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15 Building upon service systems thinking (Maglio et al., 2009), service design also seeks
16
17 to innovate by envisioning new forms of value cocreation within service systems (Wetter-
18
19 Edman et al., 2014). This holistic and systems view can make a significant contribution to
20
21 overcoming healthcare system fragmentation and moving toward integrated care. Although
22
23 some key processes have been improved, such as the ease of finding physicians and scheduling
24
25 through online portals, there are still large gaps, such as the early recognition of preventive
26
27 healthcare problems, inadequate communication between multiple providers, or the
28
29 unavailability of personnel specifically devoted to enhancing the patient journey through the
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31 healthcare maze. A service design systemic approach to understanding and designing for the
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33 patient experience throughout the continuum of the healthcare journey across their lifetime and
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35 across a multitude of service providers can contribute to overcoming these challenges, hence
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37 moving toward integrated care.
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43 Unraveling the interdependencies between healthcare actors is important for
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45 developing new services that improve the wellbeing for the overall network (Anderson et al.,
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47 2013; Čaić et al., 2019b). Service design tools, such as actor network maps (Morelli and
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49 Tollestrup, 2007) or maps of multiactor activities, interactions, goals, and potential conflicts
50
51 (Patrício et al., 2018), help in visualizing and understanding the complexity of these value
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53 networks. A multiactor, systemic approach of service design can contribute to overcome the
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55 current revenue-driven focus of healthcare systems, which are misaligned with the goals of
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57 enhancing patient health and preventing disease.
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3 Complexity in healthcare systems is pronounced through the large number of actors
4 and interactions, but also through their multilevel structure, from individuals to healthcare
5 organizations, networks, and the national healthcare system. Service design offers an
6 integrative multilevel approach (Patrício et al., 2011), enabling zooming in and out from
7 designing interactions and touchpoints at the micro-level (Sangiorgi, 2009) to designing service
8 concepts within value constellations (Patrício et al., 2018) to designing for institutional change
9 in service ecosystems (Vink et al., 2019). This multilevel approach can help in addressing the
10 interdependencies across healthcare system levels, creating solutions that balance individual,
11 organizational, network, and societal wellbeing (Beirão et al., 2017).

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24 *A service systems approach to design the Portuguese National Electronic Health Record*

25 Electronic health records (EHRs) offer an integrated view of a patient's clinical history from
26 different points of care, supporting continuing, quality, and integrated healthcare while
27 avoiding duplication of efforts and costs, such as repeated exams (McDonald et al., 2014).
28 However, the benefits of EHRs have frequently been hampered by a poor user experience and
29 lack of user adoption, leading to the failure of EHRs in several countries (Nguyen et al., 2014).
30 To address these challenges, a four-year project involved a service design approach in the
31 development of the Portuguese National EHR (Patrício et al., 2018).

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33 First, the exploration stage involved the study of goals and value cocreation activities
34 of multiple healthcare actors (i.e., citizens, doctors, nurses, and pharmacists). Second, mapping
35 the health journey from birth to death from the citizen's perspective offered an integrated view
36 of the continuum of multiple touchpoints within the healthcare system. This also enabled
37 viewing the myriad of actors in the healthcare system through an actor network map, depicting
38 their multiactor activities and interaction models; this was followed by a detailed examination
39 of the relationships among the most relevant actors, their multiple goals, and their potential
40 conflicts (Patrício et al., 2018).

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3 This approach was key to designing the EHR as an enabler of value cocreating
4 interactions among actors through shared health information and for developing a service
5 solution that would balance the conflicting interests of different actors. Through a sense-
6 making approach, different actors were brought together in participatory design workshops to
7 jointly codesign the EHR for their specific profile and for the health system as a whole. In these
8 participatory sessions, key decisions were made regarding the information available to citizens
9 and healthcare professionals, here in an attempt to balance the potential conflicting goals of
10 citizens' data privacy and doctors' access to data. For example, a new access auditing
11 functionality was added to the EHR, enabling doctors to access patient information, but also
12 enabling citizens to monitor who had access to their data.
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26 A multilevel service design approach also enabled zooming in and out from an overall
27 view of the EHR for the national healthcare system to how the EHR would be adapted to each
28 actor. After designing the EHR at the healthcare system level, the design drilled down to
29 specific service concepts and service architectures for citizens, doctors, and nurses (Teixeira et
30 al., 2019b). This multilevel view was important for balancing wellbeing and system viability
31 at the individual, organizational, and health ecosystem levels. The system has been successfully
32 adopted by citizens and healthcare professionals since its launch in 2012.
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43 **Developing a research agenda for service design for healthcare** 44 **transformation**

45 Healthcare service systems are facing dramatic challenges and need urgent innovation (Berry,
46 2019). However, moving toward this new vision of care requires a profound transformation of
47 healthcare systems, from changing the mindsets of people and healthcare practitioners to
48 integrating the myriad of healthcare providers for continuum of care to effectively leveraging
49 technology for people-centered healthcare innovation.
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3 The previous section shows how service design approaches can contribute to healthcare
4 transformation. However, this initial research also opens new opportunities for service design
5 in healthcare. Building on this exploration, this section develops a research agenda for
6 untapping the potential of a service design human-centered, transformative, and service
7 systems approach, positioning it as a catalyzer of healthcare transformation, as summarized in
8 Table 1. Finally, this section also explores how service design research should advance in terms
9 of theoretical foundations, multidisciplinary bridges, and new methods and tools to address
10 healthcare challenges.

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24 *Using a service design human-centered and codesign approach to leverage*
25 *technology and empower people-centered care*

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28 ***Developing service design capabilities in healthcare for an innovation culture toward***
29 ***people-centered care:*** Healthcare organizations have started to experiment with new
30 innovation approaches, such as health or design labs, as a means to creatively address complex
31 health challenges. Here, service design has been introduced as a way to support health
32 organizations to leverage people-centered care, as well as to cocreate new services with a wide
33 array of local actors. Despite this growing phenomenon, the impact of developing design
34 capabilities to foster cultural change in healthcare organizations has not been studied, and
35 challenges exist regarding how to scale up initial local experimentations. Therefore, service
36 design research should go beyond its application in specific healthcare projects, working
37 toward developing service design capabilities in healthcare organizations for a continued and
38 long-term effort to embed a human-centered and participatory mindset.

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55 ***Evolving service design to leverage and embed emerging technologies as part of a human-***
56 ***centered view of healthcare:*** Service design has been mostly focused on experience-based
57 approaches, with very few studies on how emerging technologies can be applied to support
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3 healthcare innovation. It is now urgently needed for service design to explore both theoretical
4 frameworks and action research projects to question how a human-centered design approach
5 can balance the pervasive nature of health technologies (Röcker et al., 2014). To this end,
6 service design research should integrate research from science and technology studies to inform
7 approaches that can digitize healthcare. Studies are needed on how to design for the ethical,
8 equitable, and democratic use of the wide range of data developed within services for health,
9 here with a focus on people's needs and rights. Furthermore, adopting emerging technologies,
10 such as augmented and virtual reality, should also complement service design approaches for
11 better evaluating human experiences within current and future solutions.
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24 ***Using human-centered design and codesign to enhance equity and promote service access***
25 ***in healthcare:*** Service design should enhance its human-centered design approach to better
26 balance and integrate experiential and lay knowledge and resources that can come together
27 when aiming for cocreation in healthcare innovation. For example, experience-based design
28 approaches have been questioned for their inability to engage with patient associations and
29 social movements (Williamson, 2010) or to challenge power relations in healthcare settings
30 (Farr, 2017). Future research is needed to develop approaches and core design principles that
31 can better balance top-down and bottom-up change processes, leveraging the role of service
32 design in patient-led and collective intelligence approaches to healthcare (Broadbent, 2018).
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48 ***Leveraging service design as a creative and transformative approach to***
49 ***envision new healthcare futures toward wellbeing***

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52 ***Leveraging service design as a creative approach for developing healthcare services where***
53 ***issues are life critical, the future is abstract, and people might not have agency:*** Service
54 design embraces a collective, creative approach where users are viewed as experts with unique
55 knowledge and can codesign new services. In a healthcare setting, topics are often sensitive,
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3 issues are difficult to express, or people have limited cognitive abilities, which hinders them
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5 from taking an active part and sharing their knowledge. Future research might tap into how
6
7 these hindrances can be considered through service design, namely what kinds of service
8
9 design methods and tools can be used. Research using visual service design approaches, such
10
11 as design probes and design games (Brandt, 2006), can provide a deeper understanding of these
12
13 sensitive and abstract health-related topics, while involving healthcare staff and patients'
14
15 family members in value network mappings (Čaić et al., 2019a) can shed new light on the
16
17 tensions and conflicts among healthcare actors.
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22 ***Using service design to promote a transformative healthcare approach toward wellbeing:*** To
23
24 embrace human diversity, service design needs to continue developing its inclusive approaches
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26 to ensure that there is an equal opportunity for people with diverse demographic backgrounds,
27
28 social positions, and other social determinants to achieve their full health potential. Fostering
29
30 service design for inclusivity calls for personalized approaches in healthcare ideation, and in
31
32 the development and delivery phases; doing so can contribute to cultural change based on
33
34 inclusive service system design (Previte and Robertson, 2019). For example, increased
35
36 healthcare automatization may imply ensuring smooth processes for people with varying
37
38 digital skills and literacy levels. Constantly reflecting on transformative processes, on the
39
40 consequences for the involved healthcare actors, and on a transformative culture is thus
41
42 necessary (Sangiorgi, 2011). Nurturing a service design mindset and fostering the skills and
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44 dynamic competencies among the healthcare personnel and management are necessary for the
45
46 emergence and embeddedness of transformative design cultures in healthcare.
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52 ***Using a creative approach of service design to leverage data-driven technology for***
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54 ***healthcare:*** Patient health-related data are becoming a driving mechanism of healthcare
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56 transformation (Accenture, 2018). Because emerging technologies (e.g., AI, machine learning,
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58 robotics, etc.) heavily rely on customer data, there is a growing concern regarding algorithmic
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3 biases, the absence of ethical regulations, and the unintended consequences of the utilization
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5 of health-related data. Thus, service design research needs to explore ways to contribute to
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7 data-driven healthcare and to advance the body of knowledge on data-related threats, such as
8
9 patient discrimination, data sovereignty, and compromised privacy. On the one hand, there is
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11 a need for greater data integration – combining clinical data, self-reported data (e.g., weight
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13 data), personal wellness data (e.g., data tracked through wearables, including steps), and the
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15 social determinants of health to better address heterogeneous health-related needs (Accenture,
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17 2018). On the other hand, there is a need for designing protocols to decrease data security
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19 uncertainties, hence ensuring greater data transparency. Patient trust can be achieved through
20
21 secure digital dialog platforms and block-chain technologies, but also through a strong focus
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23 on a human touch and warmth-related human capabilities. To achieve the transformative force
24
25 of service design, it is necessary to have policy makers on board, involving them in the design
26
27 process through democratic and participatory service design approaches.
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33 *Adopting a service design service systems perspective for integrated care*

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35 ***Using service design to create integrated, balanced solutions to address the multiple goals of***
36
37 ***different healthcare actors for an integrated patient journey:*** Healthcare systems have
38
39 become increasingly fragmented, breaking apart into complex networks of subspecialties,
40
41 insurance plans, and competing practices. Therefore, healthcare is in urgent need of innovation
42
43 toward integrated care and offers relevant research opportunities to explore a patient's journey
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45 view. This understanding of patient navigation and experiences across the current myriad of
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47 healthcare and insurance providers is key for improving healthcare systems and moving them
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49 toward integrated care. On the other hand, integrated care also requires addressing the needs
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51 and balancing the different goals of multiple network actors, such as public and private
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53 practices. Healthcare, therefore, offers research opportunities to use a service design systemic
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55 approach to understand the different and interconnected activities and goals of multiple
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3 healthcare actors, hence collaboratively cocreating balanced and aligned solutions, and
4
5 fostering a sense of ownership by involving the different healthcare actors in codesign
6
7 processes (Patrício et al., 2019). Furthermore, finding novel ways to investigate and resolve
8
9 trade-offs between the individual and collective wellbeing calls for a multidisciplinary
10
11 approach, leveraging the competences of service designers, medical researchers, public health
12
13 specialists, and technology developers, among others (Čaić et al., 2019a).

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17 ***Designing new systemic solutions to evolve toward a value-based agenda of healthcare:***

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19 Value-based care is considered critical for improving people's health worldwide and
20
21 controlling runaway healthcare costs, where value is defined as the outcomes that matter to
22
23 patients and the costs required to achieve those outcomes (Porter and Lee, 2013). This has
24
25 resulted in a push for healthcare systems and all their stakeholders to embrace the “value
26
27 agenda” – an overarching goal to maximize the value of healthcare to patients. However, the
28
29 change to a value-driven healthcare system that focuses on patients requires a sweeping
30
31 transformation among organizations, industry, and government. Therefore, service design can
32
33 contribute to building this value agenda of healthcare. The value-based care approach lends
34
35 itself to a multitude of service design approaches that can help address the optimacy of
36
37 healthcare delivery to the patient and the multiple conflicting goals in an integrated way.
38
39 Research on value-based care approaches may not only involve addressing all aspects of the
40
41 care delivery system that are important to the patient, such as access and cost, but also the
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43 aspects that address the humanizing aspects of care (Todres et al., 2009).

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49 ***Defining and implementing health public policy through service design:*** Service design,
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51 when seen through participatory, sense-making approaches, can offer contributions to
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53 designing healthcare public policy. Service design can greatly benefit from joining forces with
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55 health policy toward supporting the design of governance structures that establish clear clinical
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57 goals and oversee the implementation of policies for coordinating care across the continuum
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3 of health services (Kizer, 2015). Indeed, service design can support the development of policy
4 changes by helping to frame the scope of the problem, collectively envisioning new solutions
5 through participatory approaches and iteratively testing and improving the effectiveness of
6 policy interventions. Value-based programs appear to the basis of broad healthcare policy
7 going forward, and their implementation and entrenchment using principles of service design
8 offers great promise to improve their effectiveness. The example of Portugal's EHR highlights
9 how joining service design for creating the service and health policy for defining the vision,
10 outlining priorities, and the expected roles of different groups can build the basis for a
11 successful transformation.
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23 24 *Advancing service design to address healthcare challenges*

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26 The previous sections explore future research on the application of service design to address
27 healthcare challenges. However, leveraging the potential of research in healthcare also requires
28 service design to evolve as a research area, strengthening its foundations, establishing new
29 bridges with other disciplines, and developing new methods and tools.
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36 ***Strengthening service design principles and theoretical foundations:*** Service design builds
37 upon multiple disciplines from service research and design (Joly et al., 2019) and is grounded
38 in systems theory and S-D logic (Wetter-Edman et al., 2014). However, addressing complex
39 health challenges requires strengthening service design's systems thinking, shifting the
40 perspective from parts to the whole, from objects to relationships, from structure to processes,
41 and from measuring to mapping (Vargo et al., 2017). Because service design addresses the
42 complex context of healthcare with a myriad of actors, misalignments, and conflicting goals,
43 service design approaches may need to be complemented with new principles of designing for
44 interdependence, participation, and emergence (Sangiorgi et al., 2017), where designers
45 increasingly play a facilitating role and are enablers of institutional change (Vink et al., 2019).
46 Exploring new service design principles and the new roles of service design in transformational
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3 healthcare change can contribute not only toward tackling healthcare challenges, but also to
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5 evolving service design as a research area.
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8 ***Establishing new interdisciplinary bridges between service design and healthcare research:***
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10 Exploring the healthcare territory with service design also entails establishing new bridges,
11
12 understanding new contexts and languages, and collaborating with different new fields. For
13
14 example, dedicated interdisciplinary studies and experimentations are needed on how to
15
16 complement the traditional approaches to change, which have narrowly focused on quality
17
18 improvement and patient safety, with service design human-centered approaches. At the same
19
20 time, future research can explore how service design can balance creative skills with the
21
22 capabilities to adopt, implement, disseminate, and scale up solutions, as well as achieving
23
24 greater rigor and better outcome measurements in the evaluation of innovation (Støme et al.,
25
26 2019).
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31 An additional and promising bridge is between service design and evidence-based
32
33 design (EBD). The EBD approach toward design relies on the careful empirical study of human
34
35 responses and outcomes to inform design decisions (Cama, 2009; Hamilton and Watkins,
36
37 2008). Indeed, EBD practice has become particularly influential in healthcare settings, where
38
39 it has been associated with improvements in the quality of care, greater patient satisfaction, and
40
41 a decrease in the number of medical errors (Ulrich et al., 2010). Therefore, future research
42
43 should explore how to conceive of healthcare facilities based on EBD thinking and
44
45 implementation, complemented by input from key stakeholders such as patients, families, and
46
47 clinicians (Berry et al., 2020). Integrating EBD with service design could potentially
48
49 incorporate the best available information from behavioral research, ultimately improving the
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51 health outcomes, economic performance, productivity, and customer experience in healthcare
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53 settings.
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3 ***Evolving service design methods and tools:*** Finally, service design has evolved regarding its
4 methods and tools, better addressing new service contexts, such as technology-enabled services
5 (Čaić et al., 2018; Teixeira et al., 2017) or its ability to examine key service design concepts
6 and tools, such as customer journey mapping (Følstad and Kvale, 2018). However, promoting
7 healthcare transformation may require the development of dedicated service design methods
8 and tools that address the specific challenges of healthcare, namely the methods for integrating
9 data-driven service innovation opportunities with the human-centered approaches of service
10 design. To this end, design research and design science research can provide useful support,
11 ensuring relevance and rigor in the development of new design methods (Teixeira et al.,
12 2019a). Moreover, going beyond applying service design in specific healthcare projects and
13 moving to creating a service design, human-centered, and participation innovation culture
14 requires new approaches to develop the design capabilities in organizations.

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Overall, healthcare is in need of and offers immense opportunities for service design research, with a high potential for significant research and societal contributions. Embracing these challenges opens new ground for leveraging and extending the application of service design in healthcare, but it also requires advances in the concept of service design itself. We hope this framework and research directions encourage service researchers to embrace these challenges, helping them leverage service design for healthcare transformation.

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VISION OF HEALTHCARE

HEALTHCARE CHALLENGES

SERVICE DESIGN FOR HEALTHCARE TRANSFORMATION

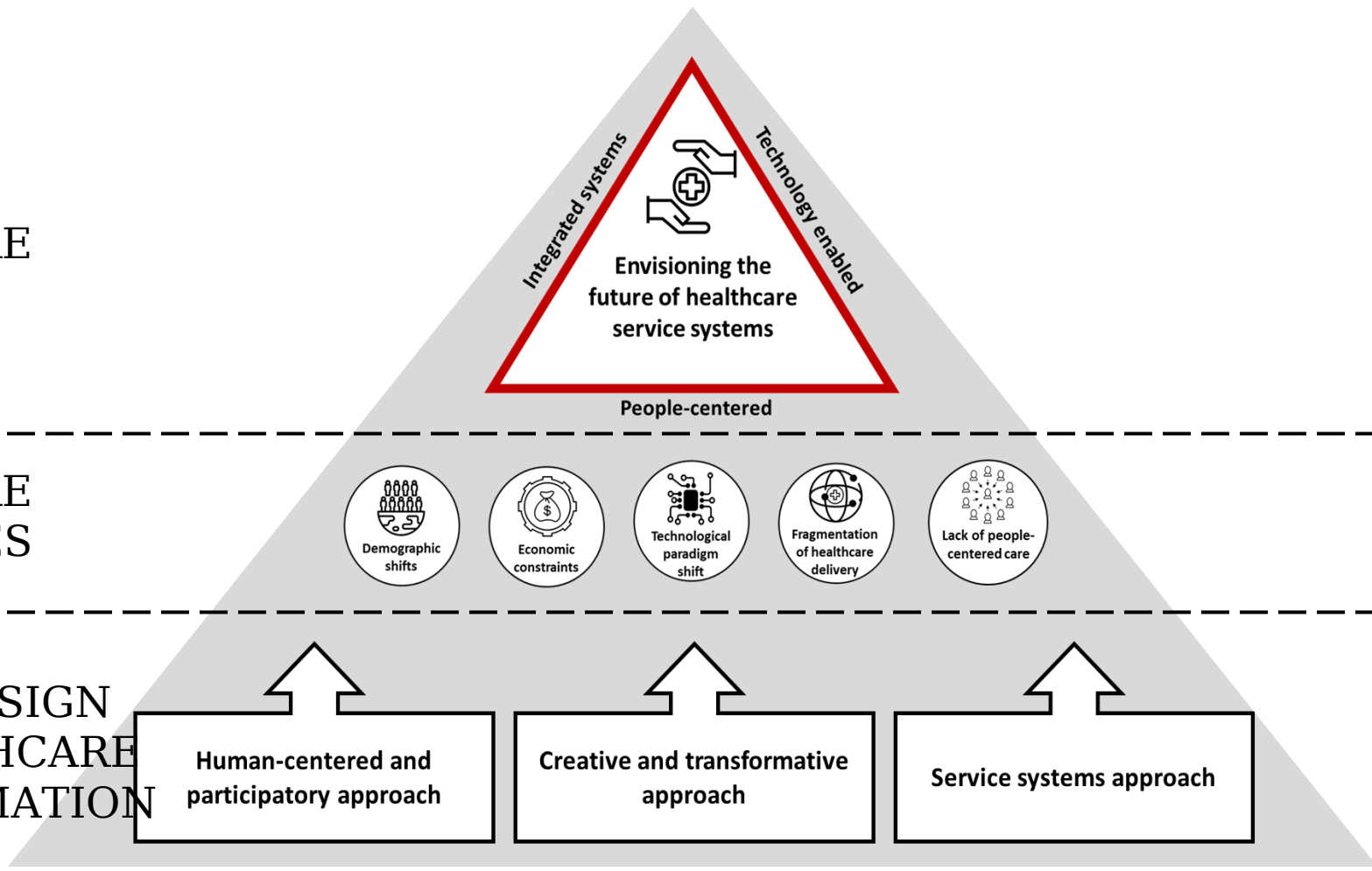


Table 1. Future research directions for leveraging service design for healthcare transformation

<p>Using a service design human-centered and co-design approach to leverage technology and empower people-centered care</p>	<ul style="list-style-type: none"> • Developing service design capabilities in healthcare for an innovation culture toward people-centered care. • Evolving service design to leverage and embed emerging technologies as part of a human-centered view of healthcare. • Using human-centered design and co-design to enhance equity and promote service access in healthcare.
<p>Leveraging a service design creative and transformative approach to envision new healthcare futures toward wellbeing</p>	<ul style="list-style-type: none"> • Leveraging service design creative approach for developing future health care services where issues are life critical, future is abstract, and people might not have agency. • Using service design to promote a transformative healthcare approach towards wellbeing. <p>Using a creative approach of service design to leverage data-driven technology for healthcare.</p>
<p>Adopting a service design service systems perspective for integrated care</p>	<ul style="list-style-type: none"> • Using service design to create integrated, balanced solutions to address multiple goals of different actors for an integrated patient journey. • Designing new systemic solutions to evolve towards a value based agenda of healthcare. • Defining and implementing health public policy through service design.
<p>Advancing service design to address healthcare challenges</p>	<ul style="list-style-type: none"> • Strengthening service design principles and theoretical foundations. • Establishing new interdisciplinary bridges between service design and healthcare research. • Evolving service design methods and tools.

Response to Reviewers

JOSM-11-2019-0332

Leveraging Service Design for Healthcare Transformation: Toward People-Centered, Integrated, and Technology-Enabled Healthcare Systems

We would like to thank the Editor and the two Reviewers for their valuable and insightful comments and suggestions in this round of review. We have significantly changed the manuscript according to these comments, which helped us significantly improve the paper. We provide a point by point response to the Editor's and Reviewers' comments below.

Response to Editor's comments

The reviewers are of the view that your study is interesting, timely and has the potential to provide contributions to service literature

Thank you for the positive feedback.

However, they have requested to improve clarity, flow of arguments and make it into more user friendly document, incorporating short cases and please try to reduce the length of the manuscript. Reviewers have also pointed to language inconsistency and hence using a copy editor is highly recommended.

Thank you for these suggestions. In response to these comments, we undertook a significant revision of the paper, namely:

- We introduced more examples and added the mental healthcare project as a short case early on in the paper, in the Introduction (pp. 3).
- We made a significant effort to improve the clarity and flow of the paper.
- We shortened the manuscript following reviewers' recommendations. We merged the previous sections on service design and service design in healthcare, which have now become one section only, shortening them from 16 to 10 pages. However, following Reviewers' recommendations, we also further elaborated the research agenda, which was extended from 6 to 9 pages. We would also like to highlight that due to the conceptual nature of the article, the literature review is more extensive, resulting in 11 pages of references. Overall, we tried to find a balanced solution by shortening the

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3 paper from 30 to 26 pages in terms of body of text. Although this is not a radical length
4 reduction, we believe we significantly shortened the service design sections, and we
5 also significantly eliminated repetitions to address Reviewers' comments.
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- 8 • We have used a copy editor to improve language consistency.
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Journal of Service Management

Response to Reviewer 1's comments

Reviewer 1's comment: Originality:

Your paper addresses a very interesting and relevant topic: "Leveraging Service Design for Healthcare Transformation: Towards a People-Centered, Integrated and Technology-Enabled Healthcare System". It is surely a "hot" topic that has the potential to attract a lot of attention and make a significant contribution. In light of the growing interest in healthcare and service design, your paper's topic is very timely. However, I found minor limitations at the moment. In this friendly review, I briefly detail these limitations and offer some suggestions for improvement.

Authors' response: Thank you for the positive feedback. We have undertaken a significant revision following Reviewers' comments, which we believe that helped us significantly improve the paper.

Reviewer 1's comment: Introduction:

The introduction section of the paper elaborates on the research rationale of the study. You do good job outlining the current state of knowledge in the area. You also cite all the relevant literature.

Comments:

Reviewer 1's comment: - Please add a transition sentence/section at the end of page 3. Currently the jump to Service Design definition is sudden and unjustified.

Authors' response: Thank you for this suggestion. In response to this comment, we added a sentence on page 2 to make the transition between healthcare challenges, stating the need to rethink and redesign healthcare systems. Building upon that, we introduce service design as an approach to the needed healthcare transformation.

Reviewer 1's comment: - Perhaps consider strengthening the research gap. Currently, you state: "the role of Service Design for healthcare transformation remains largely uncharted". Could this be expanded to create more urgency to your study? Could you highlight the research gaps and create a stronger justification for the study?

As of now you do a good job explaining the current state of healthcare. You also do a good job explaining what service design is. What is missing in my opinion is the "urgency" of combining the two.

Authors' response: We understand the research gap was not clear. Following this comment, we added a paragraph on page 3 explaining that, despite the scattered instances of Service Design application in healthcare, the role of Service Design for healthcare transformation remains largely uncharted. Then we try to be more concrete in identifying the research gap, by stating that "To explore the role of service design to its full potential, it is important to develop a more structured and systemic understanding of healthcare challenges, of how service design can contribute to overcome the barriers that hamper the evolution towards the new vision of healthcare."

Reviewer 1's comment: - Fix typo on page 5, line 28: Delete the second "can".

We apologize for the typo. We have corrected it.

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4 - *In the last paragraph of your introduction, you state: “To this end, the second section*
5 *examines healthcare challenges”. When saying Second, it is assumed that first has been*
6 *said already... Maybe use “the following” or “subsequent” instead of second, fourth...*
7 *This order is not very logical to me.*
8

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10 **Authors’ response:** We have changed the order according to Reviewer 1’s suggestion and
11 we rephrased the paragraph. We believe the text now reads much better.
12

13 **Reviewer 1’s comment: Healthcare service system challenges:**

14 - *You list some very important challenges facing the healthcare service system. Is there*
15 *away to provide further proof/citations that these are “the most important forces” as you*
16 *claim? In other words, how did you come up with these challenges? Were they chosen*
17 *subjectively? or can you find some back-ups to strengthen your claim? Another idea it to*
18 *briefly state a “method” for selecting these forces? Perhaps a review of practitioner*
19 *reports, WHO, etc.*
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23 **Authors’ response:** We understand that claiming that these were the most important
24 challenges was too strong. Although we cannot find clear evidence that these are the most
25 important challenges, we can find support to claim that these are key challenges. As such, we
26 preferred to tone down the claim, now stating that we are presenting some key challenges in
27 healthcare, without stating these are the most important.
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30 **Reviewer 1’s comment: - I am not very sure that your title: “The lack of people-centered -**
31 **care” reflects the true content of the paragraph. You mainly talk about the importance of**
32 **being people centric, but you do not show how there is a lack of it. Your first paragraph**
33 **defines “people centered care” but doesn’t show how it is missing in today’s healthcare.**
34

35 **Authors’ response:** Thank you for this comment. As suggested by Reviewer 1, we now
36 more clearly identify the barriers and the lack of people-centered care in current healthcare
37 systems based on existing reports, and we identify existing barriers to evolution towards
38 people-centered care (page 5).
39

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41 **Reviewer 1’s comment: Your second paragraph talks about the role of healthcare staff and**
42 **their well-being, but how does it relate to you title? Perhaps strengthen the claim of lack of**
43 **patient centered claim with further examples, statistics, cases, etc.**
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46 **Authors’ response:** We understand that mentioning the employee wellbeing may not be the
47 core of the people-centered care challenge that we are addressing. As such, we removed the
48 mention to employee wellbeing and focused only on the lack of people-centered care.
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51 **Reviewer 1’s comment: - You state on page 9: “Service providers in healthcare industries**
52 **have become increasingly fragmented into a bewildering array of subspecialties, external**
53 **laboratories, and competing practices”. I would suggest adding insurance plans and**
54 **companies. It is one of the main challenges in the US (at least) since different insurance**
55 **companies/plans cover different procedures and the variation in costs is bewildering.**
56 **Another key issue to consider mentioning is the fact that patients and providers are**
57 **confused and overwhelmed by the amount of competing options and choices pushing many**
58 **to avoid making a decision or being unable to make a decision related to their healthcare.**
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4 **Authors' response:** Thank you for this suggestion. We have enriched the text on
5 fragmentation of healthcare systems with the complexity of current insurance plans to the
6 challenge of fragmentation of healthcare systems on page 6.
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9 **Reviewer 1's comment: Towards a people-centered, integrated and technology-enabled
10 healthcare system:**

11 - *You provide a good rational for the people-centered, integrated and technology-enabled
12 healthcare system on pages 11-13.*
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16 **Reviewer 1's comment: Service Design- I found the Service Design section on pages 13- 21
17 a bit too descriptive. It is great, but also it is a relatively large section of your paper where
18 you don't talk much about the matter at hand, which is healthcare. For someone familiar
19 with Service Design, this might sound a bit repetitive. Perhaps, it is worth summarizing or
20 integrating healthcare examples and the application from the following section? I can see
21 that you are trying to introduce Service Design first and then talk about its application in
22 healthcare, but I am wondering if it is better to integrate both sections to avoid being
23 descriptive and also to avoid repetition.**
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26 **Authors' response:** We agree that the service design section was too descriptive and the two
27 sections were a bit repetitive. To respond to this comment, we have significantly shortened
28 the section on service design and we have integrated it in the section "Leveraging Service
29 Design towards people-centered, integrated and technology-enabled healthcare". We now
30 make a short description of each of the three service design approaches and go straight to
31 how each one can contribute to transform healthcare towards the vision of people-centered,
32 integrated and technology-enabled care. In results, we shortened the two sections from 16
33 pages to one section with 10 pages.
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38 **Reviewer 1's comment: - Please fix grammar on page 22: "Research projects that have
39 contributed to both promote healthcare transformation and advance Service Design
40 research." Should read: "Research projects that have contributed to both promoting
41 healthcare transformation and advancING Service Design research."**
42

43 **Authors' response:** We apologize for the typo. We have corrected it.
44

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46 **Reviewer 1's comment: - Section: "Using Service Design human-centered approach" has
47 paragraph-long sentences. Please proof-read and copy edit as there is a number of
48 grammatical mistakes in the manuscript. For example: "Service Design is participating to
49 (should be IN) the challenge of developing more inclusive, efficient and integrated care
50 (Fisk et al., 2018).**
51

52 **Authors' response:** We have made a significant effort to improve the flow of the article, and
53 we have professionally proof-read and copy edited the article to improve the writing style.
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57 **Reviewer 1's comment: - Please fix grammar: "...healthcare eco-system contribute their
58 knowledge and experience for (should be TO) understanding the service needs and
59 developing new ideas".**
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4 **Authors' response:** We apologize for the incorrecion. We have corrected it and we have
5 professionally proof-read and copy edited the article to improve the English.
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9 **Reviewer 1's comment:** - *Please fix grammar: very complex sentence, consider getting rid*
10 *of one of the "which" and shorten your sentences: "Unravelling the interdependencies*
11 *between actors and their activities enables service providers to develop new services which*
12 *balance positive and negative outcomes of future technologies and which aim at improving*
13 *network well-being rather than optimizing of individual actors only (Anderson et al., 2013;*
14 *Čaić et al., 2019)".*
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17 **Authors' response:** We have made a significant effort to improve the clarity and flow of the
18 paper. We hope it reads significantly better now.
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21 **Reviewer 1's comment:** - *Please be consistent. In some places you use "well-being" in*
22 *others "wellbeing". I suggest "wellbeing".*
23

24 **Authors' response:** In response to this comment, we have searched for well-being in the text
25 and replaced it with wellbeing.
26

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28 **Reviewer 1's comment:** *Developing a research agenda for Service Design for healthcare*
29 *transformation 3 - For me this was the most interesting part of your manuscript. This is*
30 *where you are actually making a strong contribution. I find the prior sections a bit*
31 *descriptive to someone who is familiar with Service Design. As such, I suggest summarizing*
32 *the description of service design section, also summarizing the case examples (as 2 out of*
33 *the 3 (as far as I know) are published articles and you can refer you readers to them*
34 *without lengthy description of cases) and finally consider extending the research agenda*
35 *section as this is where the real contribution lies.*
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38 **Authors' response:** Thank you for this suggestion. We have significantly shortened the
39 section on service design and we have integrated it in the section "Leveraging Service Design
40 towards people-centered, integrated and technology-enabled healthcare". We now make a
41 short description of each of the three service design approaches and go straight to how each
42 one can contribute to transform healthcare towards the vision of people-centered, integrated
43 and technology-enabled care. With this effort, we significantly shortened these sections from
44 16 to 10 pages.
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47 We have also significantly expanded the section on the Future Research Agenda, improving
48 and elaborating more on each research direction, following the structure of Table 1.
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51 **Reviewer 1's comment:** - **I would also advise adding some concreteness to your suggested**
52 **solutions.** In other words, try to elaborate on the "how". Perhaps discuss the Service Design
53 methods that could be employed in more details? by who? at what level? Where shall we
54 start? What would be the process? Who is responsible? I think answering some of these
55 questions can help you overcome some of the descriptive parts.
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58 **Authors' response:** Following Reviewer 1's comment, we have further elaborated each of
59 the service design research direction, trying to be more concrete on the specific service
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3 design future research opportunities, how they may be pursued, and what their implication
4 are.
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8 **Reviewer 1's comment: Please consider the following papers in your review:**

9 *Alkire, L., Mooney, C., Gur, F., Kabadayi, S., Renko, M., & Vink, J. (2019). Transformative*
10 *service research, service design, and social entrepreneurship: An interdisciplinary*
11 *framework advancing wellbeing and social impact. Journal of Service Management – Early*
12 *Cite*

13 *Anderson, S. T., Nasr, L., & Rayburn, S. W. (2018). Transformative Service Research and*
14 *Service Design: Synergistic Effects in Healthcare. The Service Industries Journal, 38(1–2),*
15 *99–113.*

16 *Hurley, E., Trischler, J. and Dietrich, T. (2018), "Exploring the application of co-design to*
17 *transformative service research", Journal of Services Marketing, Vol. 32 No. 6, pp. 715-*
18 *727.*

19 *Previte, J. and Robertson, N. (2019), "A continuum of transformative service exchange:*
20 *insights*

21 *for service and social marketers", Journal of Services Marketing, Vol. 33 No. 6, pp. 671-*
22 *686.*

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26 **Authors' response:** Thank you for the literature suggestions. They were particularly
27 valuable for the transformative service design approach sections of the article. We have
28 added them on page 13, and page 21.
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31 **Reviewer 1's comment: Finally, thank you for considering me for your friendly review. I**
32 **wish you the best of luck with your research and hope my comments will help you advance**
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34 **Authors' response:** We would like to thank the insightful comments of Reviewer 1.
35 Following these comments, we have undertaken a significant revision of the paper and we
36 believe it has been significantly improved. We hope we have successfully addressed all the
37 comments.
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Response to Reviewer 2's comments

Reviewer 2's Comments:

In addition to my comments above, I offer the following advice:

Reviewer 2's Comment: 1. *Several times the authors represent Service Design as having two critically important features: Human-centered and Human Participation in Design (see pages 16/62 "dual dimensions" and 22/62 "applying an experienced-based design approach" and "capacity to actively engage people in the design and innovation process." I would suggest that the authors utilize these two factors to assess how Service Design can better create a patient-centered health care system. This would provide a bit more structure to the paper, which is a bit meandering and repetitive.*

Authors' response: We agree that a human-centered and participatory approach is a key pillar of service design that can have a significant potential contribution to foster people-centricity of healthcare systems. Focusing on these two service design elements could lead to a more in-depth examination of the lack of people-centered care and the potential of service design to address this challenge.

However, we consider that a significant potential of service design lies in the integration of the three approaches (human-centered and participatory design; creative and transformative; service systems perspective). At the same time, literature indicates that healthcare challenges of lack of people-centricity, fragmentation and emerging technologies are intertwined and need to be tackled in an integrated way. As such, we would prefer to maintain the broader focus of the initial version of the manuscript.

We understand and apologize that the paper was not clearly focused and was repetitive. To address Reviewer 2's comment, we significantly shortened the service design section and incorporated it in the subsequent section entitled "Leveraging Service Design towards people-centered, integrated and technology-enabled healthcare". We also merged Figure 1 and Figure 2. We hope that the structure and contribution of the broader framework is now clearer and that the text is less repetitive.

Reviewer 2's Comment: 2. *The first 18-20 pages of the paper read very much like a book chapter on Service Design as applied to health care. That is, very descriptive and introducing Service Design principles. I was yearning for examples or mini-cases to ground the discussion in the topic introduced at the beginning, health care transformation. I made a notation on page 18 that examples were needed, and didn't get one until page 23.*

Authors' response: Thank you for this suggestion. To respond to this comment, we added mini examples and a short case in the introduction on page 3.

Reviewer 2's Comment: 3. *The example of mental health project is very good. It should be introduced as an example in the abstract to interest a potential reader and to ground the position of the paper in an interesting example.*

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3 **Authors' response:** Thank you for this suggestion. To address this comment, we have
4 introduced the mental health project in the introduction on page 33. We were not able to add
5 the case in the abstract due to its formal structure and word limit.
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8 **Reviewer 2's Comment:** 4. The two sections titled "Leveraging Service Design creative
9 and transformative approach" and "Adopting Service Design service systems
10 perspective" seem out of place. Are they intended to provide sense-making of the two
11 previous examples? If so, I would suggest that these sections get integrated into the
12 examples. This is text that can be reduced significantly to improve the readability of the
13 paper.
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16 **Authors' response:** As mentioned above, although a human-centered and participatory
17 approaches are key to service design, we consider that a significant potential of service
18 design lies in the integration of three service design approaches (human-centered and
19 participatory design; creative and transformative; service systems perspective). A central
20 argument and contribution of the paper builds upon these three complementary and
21 constituent service design elements that together offer a more integrated approach to
22 healthcare challenges we have identified. As such, maintaining the three service design
23 elements and the three examples is fundamental to convey this integrated approach.
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26 We understand that the role of the three service design approaches was not clear. To clarify
27 this, we have strengthened the argument for considering these complementary elements in the
28 beginning of the service design section on page 9.
29

30 We understand that the text was long and repetitive. To respond to Reviewer 2's comment,
31 we significantly shortened and merged the service design section in the section entitled:
32 "Leveraging Service Design towards people-centered, integrated and technology-enabled
33 healthcare".
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37 **Reviewer 2's Comment:** 5. Figures 1 and 2: In Figure 1, I believe that the term is
38 "economic constraints." More importantly, I believe that the two figures can be
39 integrated to eliminate redundancy and to better represent what is being presented in
40 one visualization.
41

42 **Authors' response:** Thank you for the suggestion. We have integrated the two Figures and
43 we now only have Figure 1, with the vision of the future of healthcare, the barriers that hinder
44 this evolution, and how the three service design approaches can contribute to overcome those
45 barriers. We also corrected the terms.
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49 **Reviewer 2's Comment: Additional Questions:**

50 *1. Originality: Does the paper contain new and significant information adequate to justify*
51 *publication?: I think the topic of this paper is quite nice, and has the potential to make an*
52 *impact on the field of service system transformation and value cocreation utilizing service*
53 *design.*
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56 **Authors' response:** Thank you for the positive feedback. We have undertaken a significant
57 revision following Reviewers' comments, which we believe that helped us significantly
58 improve the paper.
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4 **Reviewer 2's Comment: 2. Relationship to Literature:** Does the paper demonstrate an
5 adequate understanding of the relevant literature in the field and cite an appropriate range
6 of literature sources? Is any significant work ignored?: **This paper cites a broad literature,**
7 **all of which is supportive of the points that the paper makes.**

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10 **Reviewer 2's Comment: On page 11/62 when the authors introduce the concept of passive**
11 **recipients of service vs. empowered patients, the notion of dual-sided information**
12 **asymmetry and how to design communication to alleviate this issue may be relevant (Black**
13 **& Gallan 2015).**

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16 **Authors' response:** Thank you for the reference. We found it very relevant and included it
17 on page 7.

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20 **Reviewer 2's Comment: 3. Methodology:** Is the paper's argument built on an appropriate
21 base of theory, concepts, or other ideas? Has the research or equivalent intellectual work on
22 which the paper is based been well designed? Are the methods employed appropriate?: As a
23 conceptual paper, this paper utilizes a sound logic to construct its arguments and
24 contributions. **I would have liked to have seen examples/mini-cases introduced much**
25 **earlier in the paper to provide a grounding for the conceptual development.**

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28 **Authors' response:** Thank you for this suggestion. We have added some examples and a
29 mini-case in the introduction, on page 3.

30
31 **Reviewer 2's Comment: 4. Results:** Are results presented clearly and analysed
32 appropriately? Do the conclusions adequately tie together the other elements of the paper?:
33 I like the table that clearly delineates the contributions. This makes it quite accessible.

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36 **Reviewer 2's Comment: 5. Implications for research, practice and/or society:** Does the
37 paper identify clearly any implications for research, practice and/or society? Does the paper
38 bridge the gap between theory and practice? How can the research be used in practice
39 (economic and commercial impact), in teaching, to influence public policy, in research
40 (contributing to the body of knowledge)? What is the impact upon society (influencing public
41 attitudes, affecting quality of life)? Are these implications consistent with the findings and
42 conclusions of the paper?: **I think this paper can provide a more explicit set of implications**
43 **for policy makers and society. This is notably absent from the paper.**

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46 **Authors' response:** Thank you for this insightful suggestion. As this is a conceptual paper
47 that aims to highlight service design potential contributions to healthcare and to develop a
48 research agenda, we believe that the main implications are explored in the research agenda
49 section. Following Reviewer 2's comment, we made a special effort to highlight the
50 implications of the service design research directions for healthcare managers, for policy
51 makers, and for society. Particularly, we further elaborate a specific research direction on the
52 connection between service design and health policy.

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55 **Reviewer 2's Comment: 6. Quality of Communication:** Does the paper clearly express its
56 case, measured against the technical language of the field and the expected knowledge of the
57 journal's readership? Has attention been paid to the clarity of expression and readability,
58 such as sentence structure, jargon use, acronyms, etc.: **Three items here:**

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3 **Reviewer 2's Comment:** 1. The authors should strongly consider replacing "the" with "a"
4 **in many instances.** For instance (page 4/62): "The service systems perspective provides
5 Service Design..." **Is there one perspective that has been settled upon, or is this more open**
6 **to many perspectives. "A" service systems perspective is a better way of expressing this**
7 **point. This is found many, many times throughout the manuscript.**
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10 **Authors' response:** We agree that these are important service design approaches, but the
11 field should be open to multiple perspectives. Following Reviewer 2's recommendation, we
12 have replaced 'the' with 'a' service design approach.
13

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15 **Reviewer 2's Comment:** 2. The paper is way too long. 40 pages of text can be edited down
16 considerably. There are many redundancies and repeated points.
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18 **Authors' response:** Following Reviewers' recommendations, we have significantly
19 shortened the service design section, which was integrated with the subsequent section on
20 service design and healthcare. These two sections were significantly shortened from 16 to 11
21 pages. However, following Reviewers' recommendations, we also further elaborated the
22 research agenda. We would like to highlight that, because this is conceptual paper, the
23 references occupy 11 pages. In result, the paper was shortened to 26 pages of written text,
24 and we believe repetitions were significantly reduced.
25
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27 **Reviewer 2's Comment:** 3. The authors repeatedly use the term "people-centered,
28 integrated and technology-enabled health" (e.g., p 13/62). Instead of writing this out
29 every time, perhaps it can be represented by an acronym?
30
31

32 **Authors' response:** We agree that the term was used repeatedly in the previous version. To
33 address Reviewer 2's comment, after using the term "people-centered, integrated and
34 technology-enabled health" the first time, we use subsequently the term "vision of
35 healthcare". The current version of the article only uses the full term twice in the body of text
36 and twice in the headings.
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39 **Reviewer 2's Comment:** A few minor issues:

40 **Page 10/62 "...but the potential of new technology and data solutions remains**
41 **unfulfilled" You may consider using the term "largely unfulfilled" because there have**
42 **been some advances in this area that have improved the performance of the system.**
43
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45 **Authors' response:** Thank you for the remark. We have changed the text accordingly.
46

47 **Reviewer 2's Comment:** Page 19/62: "Organizations that truly embed Service Design in
48 their organizations engage in organization-wide transformation that includes
49 modification of organizational processes..." That's WAY too many uses of organization
50 in one sentence. It does not read well.
51

52 **Authors' response:** Thank you for the remark. We have rephrased this part of the text to
53 avoid excessive repetitions.
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57 **Reviewer 2's Comment:** Page 19/62: The first paragraph under "Service Design service
58 systems perspective" is poorly written and a bit too assertive for my taste. I have no
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3 **doubt that Service Design is gaining in interest and popularity, but it should be stated in**
4 **a different manner.**
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6 **Authors' response:** We have toned down and rephrased this part of the text, to become less
7 assertive.
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10 **Authors' response:** We would like to thank the insightful comments of Reviewer 2.
11 Following these comments, we have undertaken a significant revision of the paper and we
12 believe it has been significantly improved. We hope we have successfully addressed all the
13 comments.
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