



# Customer boundary work to navigate institutional arrangements around service interactions: Exploring the case of telehealth

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## ARTICLE INFO

### Keywords:

Healthcare  
Value co-creation  
Institutional theory  
Transformative service research  
Digital interface  
Boundary work

## ABSTRACT

This research extends literature on value co-creation by examining customer perspectives on institutional arrangements of service systems and how these shape customers' efforts to navigate service interactions. Healthcare provides the empirical context for the study focusing on a digital service technology incorporated into customer interfaces. We report a qualitative inquiry carried out with 19 people with heart disease registered to a telehealth service for remote symptom monitoring. The study focuses on customer perceptions of the key differences between the healthcare system's technological, professional and bureaucratic processes compared to family and community institutions that shape customers' life worlds. We explain how customer perceptions shape healthcare experiences, and patterns of adaptive telehealth usage to co-create value highlighting how customers engage in boundary work. We conclude with a discussion of theoretical implications of applying boundary work to customer experience of digital interfaces within service systems.

## 1. Introduction

Marketing theory has developed our understanding of customers as key actors who, through their participation in consumption activities co-create firm and customer value, and construct markets (Peñaloza & Mish, 2011; Peñaloza & Venkatesh, 2006; Vargo & Lusch, 2004, 2008). There has now been extensive examination of processes through which customers co-create value, individually and collectively, in contexts ranging from health and information technology to transportation (Echeverri & Skålén, 2011; McColl-Kennedy, Vargo, Dagger, Sweeney, & van Kasteren, 2012; Tian et al., 2014). While marketing theory has traditionally focused upon dyadic interactions between producers and customers, recent literature acknowledges that value co-creation involves interactions between actors in the context of wider service systems (Vargo & Lusch, 2004, 2008, 2016). Service research and, in particular, the Transformative Service Research movement, has highlighted the importance of developing knowledge about structural arrangements of service systems and how these shape the possibility for the creation of consumer value, and hence, well-being (Ostrom, Mathras, & Anderson, 2014). To this body of research, we contribute an empirical study of how structural arrangements of a service system shape customer effort to navigate novel interfaces for service exchange.

A number of authors have pointed out that widening the perspective of marketing to include consideration of service systems connects

questions of service exchange to the institutional environments in which they are embedded (Edvardsson, Skålén, & Tronvoll, 2012). Within this view, actors' abilities to integrate resources are shaped by a far wider range of factors than individual skill and competence. Social norms, values and structures have been shown to shape actors' opportunities and capability to integrate salient resources (Arnould, Price, & Malshe, 2006; Edvardsson et al., 2012) and hence enable or constrain value co-creation (Baron & Warnaby, 2011; Hibbert, Winklhofer, & Temerak, 2012). In this paper we extend consideration of how value co-creation is related to the institutional environment, by examining how multiple institutional arrangements provide the context for customers' service interactions, while opening opportunities for creative engagement.

Research into value co-creation within health services (Elg, Engström, Witell, & Poksinska, 2014; Go Jefferies, Bishop, & Hibbert, 2019; Hardyman, Daunt, & Kitchener, 2014; Helkkula, Kelleher, & Linna, 2013; McColl-Kennedy et al., 2012; Witell, Engström, Elg, & Snyder, 2013) has shown that when there are tensions between different actors' interests within a healthcare service system, it adversely affects customer well-being (Anderson et al., 2016; Nakata et al., 2018). To explore how customers creatively engage with the processes and outcomes when multiple institutional arrangements overlap at a micro level, we concentrate upon the integration of their service interactions into their value co-creation processes through boundary work.

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<https://doi.org/10.1016/j.jbusres.2019.03.052>

Received 2 April 2018; Received in revised form 26 March 2019; Accepted 27 March 2019

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Boundary work describes the efforts of actors to define, defend and disrupt boundaries between social activities and practices (Zietsma & Lawrence, 2010). Although boundary work is mainly used to refer to boundaries of fields at the institutional level, we apply it at the individual level (Hallett & Ventresca, 2006).

Healthcare provides the empirical context for the study and we focused in particular on customer perspectives of telehealth as a service interface. Telehealth is a remote patient-monitoring service involving technology-mediated interactions between patients and healthcare providers. These interactions take place at the boundaries of the institutional field of healthcare, with acute/tertiary care at the centre (containing the most prestigious organisations and professional groups), community care organisations at the periphery, and patients' interactions with care workers at the periphery of community care (in patient homes with patients as end users of telehealth).

Technology-mediated interactions are increasingly important amongst the multiple interfaces for contemporary service interactions (Breidbach, Brodie, & Hollebeek, 2014; Patricio, Fisk, Falcao e Cunha, & Cunha, 2008). Although they are designed by the service organisation, there is considerable scope for customers to configure the interaction to fit with notions of value within their own life world, especially given that the interactions take place remotely. As such, this type of interface provides a useful focus to understand customers' active processes to mediate conflicts between the highly institutionalised field of health (Scott, Ruef, Mendel, & Caronna, 2000), embedded within service interfaces, and their everyday experience of 'life-limiting' illness (Lorig, Holman, & Sobel, 1993).

The paper proceeds by a review of value co-creation literature and draws upon research into institutional theory to discuss ways in which value co-creation processes within service systems interact with the institutional environment. Specifically, it advances the argument that the multiple institutional arrangements surrounding the service system shape actors' attempts to co-create value through various forms of boundary work. It then presents the details of a qualitative study of customer perspectives carried out with individuals with heart disease, who use in-home telehealth equipment to enable remote monitoring of their condition. Through thematic analysis we find customers' use of digital interfaces involves functional, relational and translational adaptations. By interpreting these adaptations as boundary work, we suggest customers engage in managing the experience of conflicting institutional arrangements to avoid value co-destruction. Finally, we discuss theoretical and practical implications of boundary work as a value co-creation process.

## 2. Conceptual background

### 2.1. Value co-creation and service interactions

Value co-creation has become a primary focus of attention as the service-dominant logic (SDL) literature has emerged (Vargo & Lusch, 2016; Wilden, Akaka, Karpén, & Hohberger, 2017). SDL ascribes to an experiential view of value, such that it is 'always uniquely and phenomenologically determined by the beneficiary' (Vargo & Lusch, 2008, p. 7) and suggests that 'value is created when the customer's wellbeing has somehow been improved' (Vargo, Maglio, & Akaka, 2008, p. 150). Within transformative service research it is conceived to include achievement of personal goals, including health and wellbeing and quality of life (Anderson et al., 2013). The notions of 'value-in-use' (Vargo & Lusch, 2008), 'value-in-context' (Chandler & Vargo, 2011) and 'value-in-social context' (Edvardsson, Tronvoll, & Gruber, 2011) were introduced to emphasise that people experience value within their life world through direct and indirect (e.g., word of mouth accounts) service interactions (Helkkula, Kelleher, & Pihlström, 2012a). Value co-creation requires efficient and effective integration of available resources (Greer, 2014; Hibbert et al., 2012) and goal alignment between customers and firms is associated with successful value co-creation

(Brodie, Ilic, Juric, & Hollebeek, 2013; Skålén, Pace, & Cova, 2015).

A considerable body of literature has examined these processes, including studies in the healthcare context (Elg et al., 2014; Hardyman et al., 2014; Helkkula et al., 2013; Witell et al., 2013). Healthcare is a complex and often protracted service exchange and illustrative of services in which customers, or patients, are active participants (Gallán, Jarvis, Brown, & Bitner, 2013). Scholarship has shown that they engage in various roles, activities and interactions within an ecosystem incorporating actors including healthcare professionals, alternative therapies, on- and off-line communities and family and friends (Gallán et al., 2018; Nakata et al., 2018). For instance, McColl-Kennedy et al.'s (2012) study of cancer patients distinguished eight co-creation practices (i.e. co-operating, collating information, co-learning, combining complementary therapies, connecting, co-production, changing ways of doing things and cerebral activities such as sensemaking and emotional labour) that, in combination, reflect contrasting practice styles. Co-creation activities are recognised to differ in terms of their difficulty and the effort required on the part of the patient (Sweeney, Danaher, & McColl-Kennedy, 2015).

A key development in the SDL literature stems from the acknowledgement that service exchanges take place in value networks or service systems (Chandler & Vargo, 2011), which are characterised by social conditions that shape value and value creation processes (and vice versa) (Vargo & Akaka, 2012). Service systems are defined as 'value-co-creation configurations of people, technology, and value propositions connecting internal and external service systems and shared information (e.g., language, laws, measures and methods)' (Maglio & Spohrer, 2008, p. 18). As such they acknowledge a role for a range of entities including individuals, peer groups, families, community groups, regulatory bodies as well as technologies. Emerging research shows how sets of actors at different levels within the system co-create value, for instance, Beirão, Patrício, and Fisk (2017) delineate how macro, meso and micro level actors in healthcare systems access, share and recombine resources to co-create value outcomes. The systems perspective also emphasises that value is co-created through multiple-interfaces (Helkkula et al., 2012a, 2012b; Helkkula, Kowalkowski, & Tronvoll, 2018; Patricio et al., 2008; Rayport & Jaworski, 2004).

Importantly for the current paper, such service systems can also be considered in relation to wider social institutions that shape, and are shaped by, resources (Koskela-Huotari & Vargo, 2016) and value co-creation processes (Edvardsson et al., 2012). The notion that service systems are embedded in different institutional environments has raised new questions about the processes of service interaction (Edvardsson et al., 2012; Koskela-Huotari, Edvardsson, Jonas, Sörhammar, & Witell, 2016; Vargo & Akaka, 2012; Wilden et al., 2017). This issue is particularly pertinent when actors across a service system span fields dominated by different institutions. Our current research is motivated by the view that focusing on interactions informed by competing institutional arrangements can show how institutional structures may systemically favour certain actors, marginalising others and affecting their ability to co-create value (Bone, Christensen, & Williams, 2014). Recent studies consider challenges faced by central actors undertaking activities to transform dominant institutions using service design principles (Kurtmollaiev, Fjuk, Pedersen, Clatworthy, & Kvale, 2018; Sharma & Conduit, 2016). Less is known about how peripheral actors within service systems engage in changing institutions (Dolbec & Fischer, 2015). This paper focuses on how customer perspectives of interactions with the service interface for service exchange shape and are shaped by institutional arrangements. To consider this, we next introduce the concept of boundary work.

### 2.2. Boundary work and conflicting institutional arrangements at service interfaces

Although institutional theory is often considered to focus on more

durable and resilient aspects of social structure (DiMaggio, Powell, Gabe, Calnan, & Bury, 1991; Greenwood & Hinings, 1996; Thornton & Ocasio, 1999, 2008), multiple branches of institutional literature are concerned with explaining the possibility and nature of innovation and change (Garud, Jain, & Kumaraswamy, 2002; Seo & Creed, 2002). There has also been growing attention to the micro-foundations of institutions, including a focus on the activities by which actors create, maintain and disrupt institutions (Lawrence, Suddaby, & Leca, 2011). In particular, discussions of institutional heterogeneity invoke the idea that institutions are not deterministic of social life; rather, multiple institutional imperatives provide the basis for actors' reflective engagement with their institutional environment. Social actors are required to engage creatively and agentially with elements of heterogeneous institutions and, in doing so, contribute to institutional stability and change (Meyer & Hammerschmid, 2006; Pache & Santos, 2013; Lawrence, Suddaby, & Leca, 2009; Thornton, Ocasio, & Lounsbury, 2012).

To capture the collections or assemblages of institutions within particular service eco-systems, Vargo and Lusch (2016) use the term 'institutional arrangements'. The notion points to the patterns of institutions that have developed over time within particular societal sectors, shaping peoples' assumptions, values, meanings and beliefs (Thornton & Ocasio, 1999). Different societal sectors are governed by institutional arrangements that explain individual and collective understandings and behaviours, while maintaining the possibility that individuals and organisations are positioned between different sectors, contending with different, even contradictory ways of structuring meaning and organising activity (Greenwood, Diaz, Li, & Lorente, 2010). In this study, we consider institutional arrangements for two reasons. First, scholars have extensively examined the competing institutional arrangements within healthcare, and provide detailed longitudinal and contemporary analysis of how individuals and organisations respond variously to prevalent market-managerial, professional and bureaucratic institutional arrangements (Kitchener, 2002; Reay & Hinings, 2009). This analysis provides a theoretical context for the current study and is used to analyse our empirically derived customer perspectives. Second, the notion of an institutional field covers individuals and organisational actors who take account of one another in their symbolic categories and practices (Thornton & Ocasio, 2008) while also noting how actors embedded within particular social positions are more or less deeply embedded within particular dominant institutional arrangements (Hallett & Ventresca, 2006). Therefore, while community patients in domestic settings may be at the centre of the telehealth service exchange, they can be considered at the periphery of the field of healthcare, which is dominated by high profile organisations of tertiary care and medical professional elites (Waring, 2014). Patients, as health customers, are peripheral organisational actors, and their interactions with service organisations occur at the boundary of the institutional field.

The notion of institutional arrangements helps to identify how service systems of healthcare provision can be expected to span a more diverse institutional environment than found within health organisations. Service interactions take place between dissimilar systems and their structure plays a role in facilitating customer participation (Sharma & Conduit, 2016; Skålén et al., 2015). Although dissimilar systems have in common complex assemblages, heuristic binaries can reduce complication when studying micro level modes of interaction, and dissimilarity between systems raises questions about the conditions under which value co-creation aligns customers and providers, especially when cooperation with expert advice is key to successful outcomes but there are often tensions with what customers want (Berry & Bendapudi, 2007; Spanjol et al., 2015). The processes by which this occurs is complicated when there are multiple platforms for service interaction. For instance, the boundary between customers and service organisations differs for face-to-face versus technologically-mediated interfaces because digital interfaces introduce additional institutional

arrangements and the interaction tends to take place beyond the organisational gaze, which changes regulatory and flexibility processes within the interaction.

Recent service research has considered how interactions with entities beyond organisational boundaries affect service ecosystems (Kleinaltenkamp, Corsaro, & Sebastiani, 2018; Simmonds & Gazley, 2018) but there is limited research on how this happens. A recent exception to this is a study examining the role of boundary objects in facilitating institutional work across the service ecosystem (Sajtos, Kleinaltenkamp, & Harrison, 2018). Prior literature that examines changes to the boundaries of organisations notes that they bring together conflicting institutional arrangements. In these circumstances individuals may ignore or resist tensions in conflicting institutions, seek to compartmentalise or comply with their contradictory demands (Pache & Santos, 2013), or engage in processes of negotiation at the interactional level to seek settlements that sufficiently satisfy conflicting institutional perspectives (Bishop & Waring, 2016).

Zietsma and Lawrence (2010) identify boundary work and practice work as two inter-related forms of institutional work, with the former referring to actors' efforts to demarcate boundaries between social activities (Gieryn, 1983), and the latter capturing how practices themselves are established and changed at the institutional field level. Zietsma and Lawrence (2010) note the importance of boundary work to institutional stability and change, including the potential for boundary conflicts to open space to engage in more reflexive agentic practices.

Although boundary work has typically been considered as occurring between institutional fields, studies at the individual level have also examined the way micro-level social interactions across institutional boundaries 'suffuse institutions with local force and significance' (Hallett & Ventresca, 2006, p. 213). Hence, social interactions across institutional boundaries can be seen as a form of boundary work, and through which tensions between institutional arrangements can be actively worked out (Bishop & Waring, 2016). Here we apply the concept of boundary work to understand how customers co-create value through service exchange within service systems, which bring multiple institutional arrangements into potential conflict, and trigger meaning making processes. We define customers' boundary work as the means by which customers intentionally or unintentionally define and disrupt boundaries of service exchange activities and practices.

In summary, we suggest service interfaces potentially bring together previously distinct institutional arrangements, and create opportunities and spaces for customers to engage in boundary work to reshape their relationship with the service system and hence co-create value. In so doing we extend understanding of service exchange within service systems.

### 3. Method

#### 3.1. Telehealth as a service interface for healthcare

Healthcare, especially for chronic conditions for which service interactions are ongoing (often over many years), involves different services and multiple interfaces. Although use of technology-mediated interfaces is growing, there is limited insight into the ways they enable or inhibit the realisation of service exchange. In health research, the focus has predominantly been on on-line health communities (Keeling, Laing, & de Ruyter, 2018; Zhao, Wang, & Fan, 2015). Emerging research on novel technologies for service exchange, e.g. mobile health apps (Schuster, Proudfoot, & Drennan, 2015) and service robots (Čaić, Odekerken-Schröder, & Mahr, 2018) concentrate on the role of technologies in service networks, and research is still needed that builds understanding of interactions within the context of the multi-interface service system of which they are a part (Patricio et al., 2008; Rayport & Jaworski, 2004).

Telehealth service customers use medical electronic equipment at home to measure vital signs and respond to diagnostic questions about

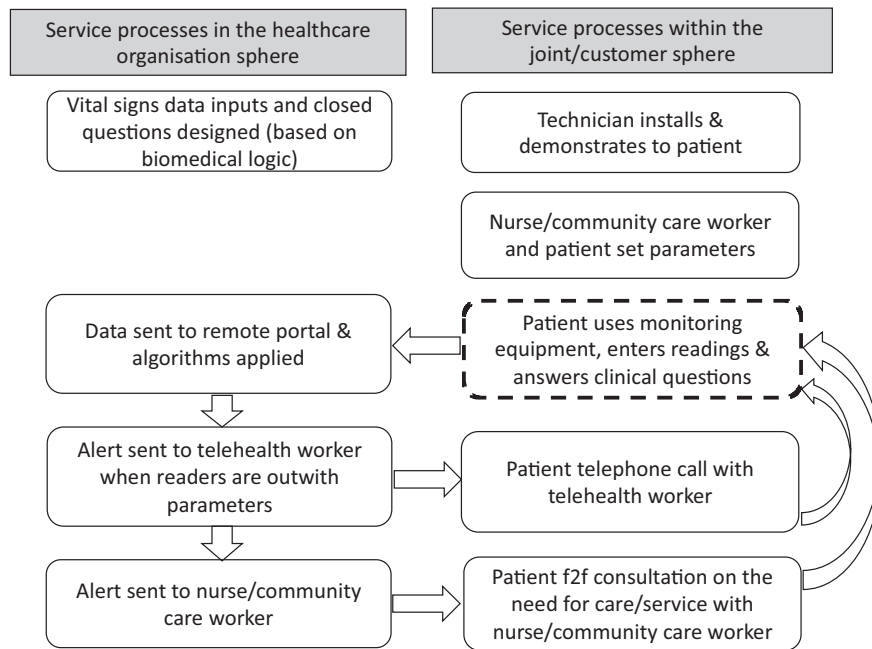


Fig. 1. The telehealth service process.

their symptoms, and telehealth machines to transmit their results to a remote computer server for analysis by local telehealth operators using computer-aided decision support software (Fig. 1).

Fig. 1 depicts the process of telehealth. Algorithms are personalised to automatically alert the service when missing data or any deviation from safe parameters set for that patient by their referring clinician are detected. Usage that interferes with intended telehealth user protocols could introduce systematic errors affecting the reliability of the service to monitor patients in their homes. Telehealth together with regular care aims to reproduce biomedical professional practices, e.g. ward triage using objective patient data gathered during regular observations to underpin evidence-based clinical decision-making (Greenhalgh et al., 2015; Oudshoorn, 2011; Stanberry, 2000). More critically, scholars largely from a medical sociology perspective have also analysed telehealth as reflecting aspects of an efficiency/managerial logic (Greenhalgh, Procter, Wherton, Sugarhood, & Shaw, 2012; May, 2015), for example, including the assumption that illness can be spotted through identification of abnormal trends. Further, that objective technology can be appropriately designed to elicit reliable measurement, transmission and analysis of objective clinical data. Clinical decisions are founded upon evidence from technology-mediated interactions. Telehealth systems also reorganise healthcare services according to a managerial logic, where telehealth systems are used for 'disciplining demand' for care by a needy patient population (May, 2015, p. 2). This suggests telehealth service interactions are shaped by multiple technological, bureaucratic (managerial) and professional institutions that shape the value sought by providers during service exchange. We know less how these influence customers' ability to determine value through service exchange when mediated through digital service interfaces.

The marketing literature considers how customers utilise multi-channel services integrating self-service technologies to improve customer perceptions of overall service quality (Sousa & Voss, 2012) especially when technology interfaces effectively break complex service processes into discrete semi-automated tasks, and offer customers 'easy to use' equipment and interfaces that accommodate only narrowly scoped forms of customer need (Blut, Wang, & Schoefer, 2016). In such cases processes tend to be structured in ways that constrain customers' interactions to fit with the managed service process (cf. Bitner, Brown,

& Meuter, 1998) while accommodating customer perceived value. Technology-based services can improve access to subjectively perceived benefits like convenience (Breibach & Maglio, 2016; Ostrom, Bitner, & Meuter, 2014), improved knowledge (Schuster et al., 2015) and empowerment (Greenhalgh et al., 2017). Within multichannel services, identifying and facilitating customer value is the aim of co-design involving multi-disciplinary teams (Dietrich, Trischler, Schuster, & Rundle-Thiele, 2017) in processes to recognise trade-offs between person-to-person and technological interfaces that account for customer experience (Glushko & Tabas, 2009; Greenhalgh et al., 2015; Patricio et al., 2008).

However, customers typically interface with the 'health system' (and hence the healthcare system's existing institutional arrangements) through telehealth technology outside of the tightly managed spaces of primary and acute healthcare provision, particularly in domestic settings of the individual's life world. As discussed above, and in spite of long-standing calls to include patient voices in health organisation decision-making, patients are not usually considered to be members of healthcare organisations, and are therefore at the periphery of influence of professional and managerial institutions seen as dominant within the field of healthcare (Chreim et al., 2013; Reay, 2005; Reay & Hinings, 2009). Instead we may expect issues of family and community to shape thought and behaviour (Thornton & Ocasio, 1999). Telehealth interfaces are therefore spaces where users are required to grapple with conflicting ways of ascribing meaning to interactions across these domains in order to 'make use' of new technology. The purpose of this research, then, is to explore how customers experience and respond to conflicting institutional arrangements as they co-create value. In particular, how they negotiate the differences between their life world and the technological, professional and bureaucratic institutions evident in telehealth. In doing so, we demonstrate the active processes through which consumers adapt and adapt to service interactions and navigate value co-creation through boundary work processes.

### 3.2. Data collection and analysis

We adopted a qualitative approach (Gioia, Corley, & Hamilton, 2012; Spiggle, 1994) to study patient use of telehealth in the life contexts wherein they enact value co-creation. The focal telehealth service

was selected because it involved patients actively using machines for self-monitoring in their homes. Purposive sampling was used to select 19 people suffering from heart disease (ages 43–90 years; 11 males, 8 females; various ethnicities) from a wider sample of experienced users of telehealth (> 2 months) in a large English metropolitan city.

We conducted participant observations of their use of the home-based Honeywell or Docobo branded telehealth equipment provided free by the National Health Service (NHS) to remotely monitor complex heart disease patients alongside semi-structured interviews of 60–90 min including time to ensure informed consent. The interview protocol used five open questions to establish rapport, understand the context into which the telehealth service was introduced, gather opinions about the service applying a critical incident approach (Gremier, 2004) to make expectations explicit and used projective techniques to encourage candour (Rook, 2006). Conducting interviews in patients' homes enabled inclusion of vulnerable patients whose activities are limited by their condition. Ethnographic observations of service interactions in context enabled us to obtain rich accounts of participants' lived experience of telehealth and supplemented participants' issues and concerns in their own voice for comparison across cases (Miles & Huberman, 1994). Ethical approval for the study was gained from the University and the NHS. Care was taken to ensure participants understood that the interview was not a clinical interaction and to avoid questions that would create emotional distress. Participants were assured of the confidentiality and anonymity of data, the conditions of consent and their rights to withdraw from the study.

Interviews were recorded and transcribed for thematic analysis using NVivo 11 for Mac. Systematic analysis generated a large set of first order concepts distilled into second order theoretical level themes and more abstract aggregate level dimensions to generate theoretical insights from the data (Gioia et al., 2012). Identifying relevant themes within and across cases and organising emic themes into emergent categories that added insight about the process of telehealth use was based on constant comparison with etic themes in the literature (Corley & Gioia, 2011), until the conceptualisation based on the data resulted in an integrated framework unifying emic and etic themes emerged (Spiggle, 1994). Theoretical saturation is reached when all identified concepts are developed and differences between them are explained, and no new themes emerged that were not already accounted for in the higher-level coding, so that theoretical abstraction grounded in the data adequately represents the state of affairs (Glaser & Strauss, 1967).

We then applied an institutional perspective (Thornton et al., 2012; Zilber, 2013) to contextualise micro level adaptation processes to the ecosystem level, and progressively abstract telehealth processes as interactions between discernible institutional fields comprised of multiple institutional arrangements. This analytical process was informed by a priori categories from previous research (Thornton et al., 2012; Zilber, 2013). Establishing the conflicting institutional arrangements was not the main purpose of the study focusing on the customer perspective. It was, however, an important starting point, which allowed us to generalise from analysis of patient perspectives to institutional theory. Thus, service exchange between actors was conceptually located where the *healthcare system* and the *patient life world* interact, characterising and characterised by the boundary space between ecosystems where interactions take place, resulting in overlapping practices and processes of innovation (Simmonds & Gazley, 2018). Table 1 shows how we conceptualised complex interactions as perceived by patients according to two field level ecosystem logics, that are themselves characterised by institutional assemblage. We find this approach analytically useful for explaining how value co-creation with telehealth is through interactions between ecosystems that are alternately consensus-driven or conflictual (Gadrey & Gallouj, 1998). This enabled a nuanced understanding of customer use of digital interfaces in value co-creation to emerge.

#### 4. Findings

In the first section of the findings we briefly illustrate the contrasting institutional arrangements characterising the healthcare service and home fields. We then move onto the main focus of our analysis, which reveals three processes of adaptation - functional, relational and translational - that reflect ways in which patients incorporate self-monitoring via telehealth into service exchange with the healthcare organisation. We present the data structure in Fig. 2.

The adaptations incorporate iterative processes of discovering and responding to tensions as people gain experience of this novel healthcare activity. The tensions that participants perceive relate to the process for monitoring chronic conditions via telehealth and decision-making on care service access (as depicted in Fig. 1) including the direct interactions via the digital and personal interfaces and the back-office systems that regulate community care encounters. In addition, tensions emanate from participants' prior experiences with primary and secondary care and perceived conflicts between their life world and the healthcare system. The ways in which they respond differ in terms of scope (of the focal service exchange[s]) and their sense of control over strategies that include compliant, challenging and collaborative actions as they navigate this novel work in ways that align with and disrupt service system and home institutional arrangements to varying degrees.

We begin by presenting evidence of conflicting institutional arrangements. The following quote shows how the community care organisation proposed the adoption of telehealth as complicit with the bureaucratic and professional institutions previously suggested to dominate healthcare (Reay, 2005; Reay & Hinings, 2009).

*[With telehealth, clinicians] spotted a spike or a rise in blood pressure [...] they intervened with some medication, and they're convinced they'd prevented another stroke. [...] telehealth is portrayed as a way of avoiding admissions. So almost errs towards: it's the financial thing, about saving money. For us, it's about supporting the patient to helping [sic] themselves and supporting the management of patients.*

(Project Manager, Telehealth Service)

The telehealth project manager describes how telehealth improves efficiency by reducing hospital admissions to save money, improving clinical effectiveness by enhancing professional decision-making, and getting patients to contribute to addressing the problem of managing a demanding patient population through increased use of self-service (i.e. 'helping themselves').

Of greater novelty, our findings show that the institutions of family and community influence the life world of our participants. All of our participants suffer from chronic disease and spent most of their time within their own home. Counter to biomedical categories of disease, participants' accounts include deep reflections on their personal health trajectory. All describe the physical, emotional, relational and identity challenges in, as one participant put it, coping with a 'body [that] keeps letting me down' (Rachel, 68). Betrayed by their bodies, they experience loss of control over what happens to them even in familiar and previously safe environments, altering their relationships with their domestic surroundings. The key challenge of illness, as described by our participants, is a burden to re-establish identities as their interactions with social and physical environments change (Strauss & Corbin, 1988). All participants have long-term engagement with health services, often reporting ongoing challenges in gaining access to and receiving appropriate forms of care. In particular participants could be seen to face continual struggles to derive value from healthcare interactions that confound their expectations informed by their lived experiences of their illness (Schütz & Luckmann, 1973). To illustrate this, our first case shows Rachel's struggle to understand her prognosis and the care she receives.

*I'm thinking, they've given me 18 months. That's the prognosis, and I'm thinking, 'If I've only got 18 months, surely I should be seeing the*

**Table 1**

How customers perceive healthcare service exchange evidences their interaction with conflicting logics.

	Healthcare service system	Life world	Examples of tensions
Dominant institutional arrangements Spaces	Technological, bureaucratic and professional Service spaces, healthcare settings (hospital, GP surgery, ambulance)	Family and community Domestic and locality	Participants often described considerable tension between the unfamiliar professional spaces of care, and their own adapted domestic arrangements. <i>'You're in the hospital, and you can't [...] go out to the fridge and get a cold drink. [...] You're reliant on someone else to bring you a cup of tea, to bring your meals to you, to bring your tablets – you've got a complete dependency [...] you can't do the things that you normally do at home, that's why you don't like it.'</i> (Howard, 66)
Risk management	Measured/quantitative	Intuitive/qualitative and context specific	While quantifiable risk management is central to professional management of chronic illness, individuals themselves described their personal interpretation of quantified data. Sakina: <i>It's [systolic reading] usually between 110 and 117 or something like that, isn't it? [...]</i> Fatima: <i>That's [pointing at the diastolic reading onscreen] usually about the 60s or 70s. Yeah.</i> Sakina: <i>So that's fine.</i> Fatima: <i>Well, that's what we think—I don't know what anyone else would think! [chuckles]</i> Sakina: <i>We go by him; that that's okay for him.</i> (daughters of Aziz, 78)
Ethical orientation	Utilitarianism	Deontological	The healthcare system focuses on quantifiable outcomes at the aggregate level; individuals focus predominantly on their own rights for care. [The doctor said], <i>'We think it's just a chest infection,' and wanted to send him home. Debbie next door, she's a nurse, who says: 'If you think he's poorly, Sarah, you can refuse to have him home.' So, I says to the doctor: 'Where's he going to go?' He says: 'He's coming home to you!' I says, 'No, he's not 'cause I'm refusing to look after him.' That was one of the hardest things I ever had to do. [...] And they said, 'Right, we'll keep him and we'll do some more tests,' and they found out it was his heart.</i> (wife of Nigel, 66)
Norms of communication	Etic accounts of symptoms; professional language, service script	Emic accounts of illness; lay language; stoicism, humour	Health professionals focus communications around discussions of known conditions, revealed through collections of symptoms. Participants tend to describe chronic conditions in relation to their personal lives and 'sick role' (Parsons, 1951). <i>"He can speak perfectly fine, but when he's in hospital or something he goes, 'I can't understand you. You'll have to talk to my daughters.' Because I think he gets confused, so he doesn't know how to answer you back."</i> (daughter of Aziz, 78)
Relationships	Large number-shallow	Small number-deep	Close family and community ties were central to participants' accounts of their chronic conditions; the importance of these commonly lie outside consideration of care planning at the health system level in which health professionals are interchangeable providers of particular treatments. <i>'I have so many appointments. See I have a lot of people coming to see me regarding my health. [...] There's the Matron [...] She's the equivalent to a doctor. She's ... takes over that [doctor's care]. Then I have people coming to see me for various things. After my stroke, I've had people come to see me, have to go for exercises. Then there's somebody that comes to test me for my memory.'</i> (Marion, 83)
Rationale for technology adoption	Service improvement, efficiency, cost reduction, drive to localism Manage population health (impersonal) Manage workload	Manage service interactions for individualised and humane care Control illness trajectory for independence from hospital	Participants describe telehealth as provider-focused, helping healthcare workers do their job more efficiently and effectively. Telehealth is customer-focused to the extent that participants use it to manage service relationships for accessing the kinds of home-based care they seek. <i>"It was just to keep an eye on your general health, sort your problems, and I think it's a good thing, because when you do your tests and there's owt wrong, they phone you straightaway. And then, if you say, 'Yes, there is this, I feel this, I feel that,' then they'll get in touch with the services you require, like the district matron, your doctor, whatever."</i> (Ray, 66)

heart man more often' [...]. If my heart's that bad, I would have thought I would have been seen more often.

(Rachel, 68)

Here Rachel questions her treatment because the cardiologist has not examined her frequently, i.e. her experience does not fit with her expectations of everyday understanding of care. At the broadest level, the experiences of service users in the study were underpinned by such conflict between technological, bureaucratic and professional logics of the healthcare system, and the family and community logics of their life

world, demonstrated in Table 1. The following sections explain how they negotiate conflict using three types of adaptations in their search for value.

#### 4.1. Functional adaptations

One set of adaptations that emerged from our analysis focused specifically upon the work of monitoring and reporting vital signs via the telehealth equipment. Given the technical elements of this work and its clinical purpose, we use the label functional adaptations. Most of our

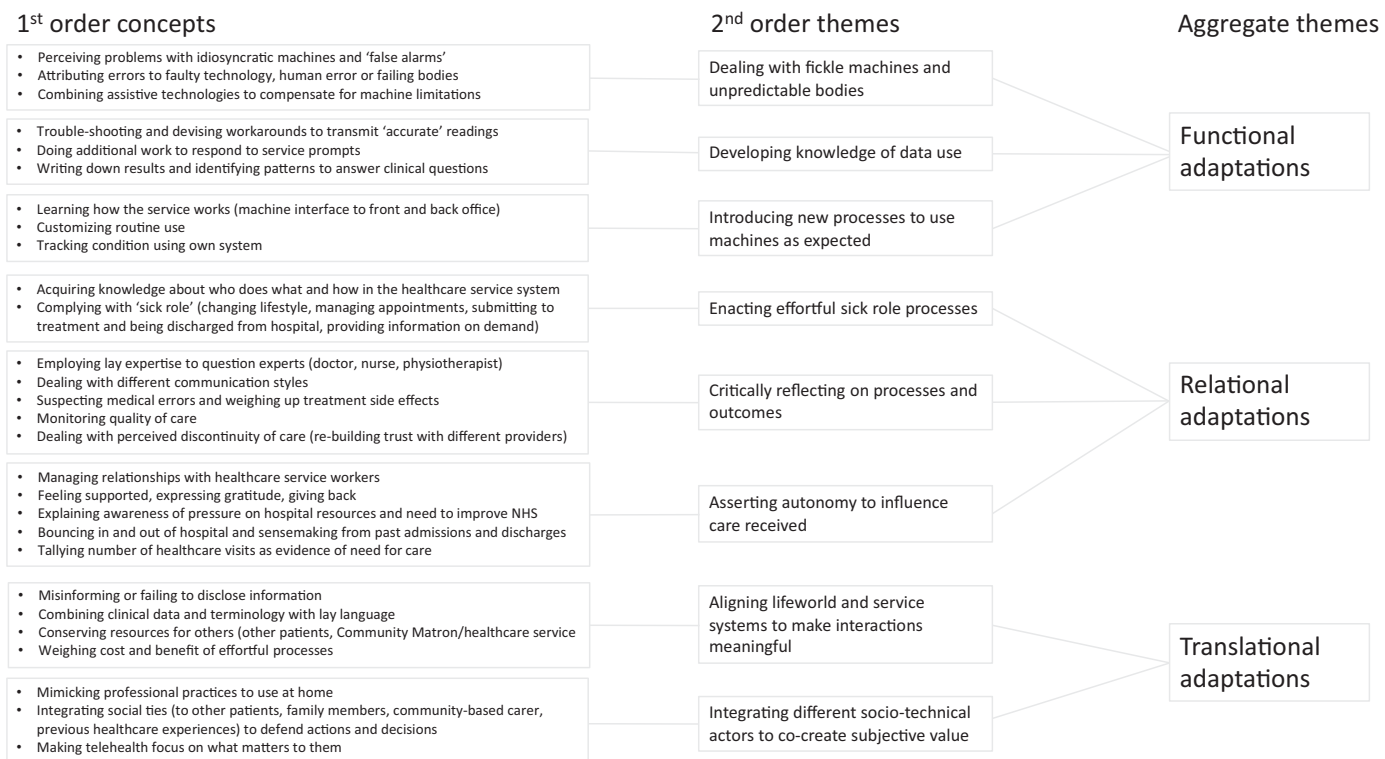


Fig. 2. Data structure.

participants found that this was not straightforward and the sub-themes reported below highlight participants' efforts to cope with technical challenges to enable the service exchange to happen.

#### 4.1.1. Dealing with fickle machines and unpredictable bodies

The telehealth service is designed to assist diagnosis by providing objective snapshots of a patient's condition to detect data points that breach acceptable parameters. Participants suggest that they try to comply with the expected use of the equipment to supply the data. However, most participants describe or are observed experiencing problems with telehealth machines, and indeed a number of users described machine unreliability as normal. Therefore, using the machines required constant 'tweaks' and often involved users contacting the service provider to report problems and rectify faults. For example, participants learn that false alarms are often due to the service's sensitivity. Telehealth workers need to record a timely and appropriate response to alerts the machine triggers on the system. Participants report various instances of reassuring the telehealth service worker verbally that the vital signs readings can be ignored. Participants also downplay machine-detected alerts during use. An example is Nigel chiding the telehealth machine for poor time-keeping and blood pressure detection. In the course of these interactions he diagnoses various symptoms of machine malfunction.

#### 4.1.2. Developing knowledge of data use

Through regular use of telehealth Nigel, like other participants, takes on a makeshift role of technical trouble-shooter, deciding which technical foibles to accept, ignore or report as faults. In doing so, users encounter a new role created by the use of new technologies, or at least a role that has not been formalised, and end up filling a void in the work for service exchange via the new technology. In the same way that 'customer feedback' is strongly encouraged as a customer role in traditional service operations, this emerges as an important new role for service customers interacting via digital interfaces. Nigel also recounts that, by talking back to the machine he makes light of his situation for his wife and reduces the machines' ability to perturb the household,

which can otherwise be a negative consequence of the work of monitoring of vital signs moving into the patients' home sphere.

Over and above ad hoc trial and error, dealing with the fickle machines requires the users to establish a body of data-infused lay telehealth expertise. Upon discovering 'faulty' readings, users adopt various adaptations and workarounds, which they devise themselves or telehealth engineers share during service call-outs so patients can continue to use the machines for routine monitoring. Nigel explains how he knows when his blood pressure monitor is misbehaving.

*Well, when you have a blood pressure going right down to, say, 110 over 168 — sorry, over 68 — on the Wednesday and on the Friday, you've got it at 151-stroke-over 92, then there's something drastically wrong with the machine. Or it's not doing it right. I also notice on that machine that sometimes it'll re-energise [re-inflate midway through] on your blood pressure, sometimes I'll go up to like 170 and then it stops pumping and it'll go down to like 146 and it'll pump again til it's 190 something. And then it'll come down, come down, come down again and give me a false reading.*

(Nigel, 66)

Nigel is confident to use the machines and is no longer anxious about his readings although he takes the work to manage his health seriously. He compares readings between multiple monitoring machines, some of which he has purchased himself, entrusting a combination of assistive technologies to check the accuracy of each. By keeping written records, identifying patterns, and learning how to respond to problems by devising workarounds, he can respond to follow up telehealth calls. Requisite expertise development therefore involves learning how to react to service calls received in response to perceived false alarms.

#### 4.1.3. Introducing new processes to use machines as expected

Learning to use telehealth can also be seen to prompt wider reflection on how the submitted data is used as an indicator of their condition as well as shapes responses from the health system, family members and carers. Consequently, all participants create new monitoring processes as they gradually expand their work to include making

judgement on diagnosis and care needs. We found considerable variance in their level of confidence about the adjustments that they make: some are uncertain about their judgements and tentative about the new processes that they introduce while others develop a greater sense of control over the scope and nature of the work. For example, the following gives Molly's account of deciding how to answer the diagnostic questions asked by the telehealth machine.

**Molly (83):** Now sometimes I'm breathless, sometimes I'm not, so I don't... My carer always says, 'No' [laughter].

**Machine:** No. [confirming her answer] Have you had any breathlessness?

**Molly:** [explaining her selected answer] You see, it could say, 'Yes' but I'll do 'No'. [...]

**Machine:** Swelling. Have you had any ankle swelling in the last 24 hours?

**Molly:** That should be 'Yes', but I don't do it. She [her personal carer] tells me not to.

**Interviewer:** Well [the machine] says, 'More than usual, much more than usual, as usual.'

**Molly:** I'll put 'as usual'.

Here Molly's adaptation process is influenced by difficulty to understand how to conceptualise answers to meet the diagnostic purpose of the questions, and her reliance on the opinion of her carer, who is often physically present in the (home) setting. Although telehealth machines are designed for usability by people with impairments, users such as Molly find it difficult to make sense of what is sought by the machine, and struggle to develop suitable processes.

Other participants' accounts suggest that, as they gain experience, they have a greater sense of control and confidence over the data entry process. For example, we see participants extending their role from monitoring and reporting into decision maker. Marion, for example, has an erratic heartbeat making it difficult to measure her pulse.

[Taking her pulse using a finger-mounted digital pulse oximeter] *I try to get a medium figure [...] it sometimes can go up to 90 and then 74. Look now. 76. 78. 79. 83. 87. [sighs] [...] this is a judgment call. It is. I think I'll make it a little bit more than 70. [...] about that, I should think.* (Marion, 83)

We see Marion deciding between possible readings of her erratic pulse, arriving at a figure that best represents her sense of well-being to the monitoring service. The reading she transmits for analysis is lower than the median, and she makes sense of her calculations in consideration of her perceived need, taking account of her recall of recent health crises. She has come to interpret her work as a telehealth user to include diagnosis and, in order to gain control over decisions regarding her healthcare, she uses a new process when reporting her vital signs. The novel processes are aligned with her goals but introduce 'errors' into the original task. Other participants' account reveals that they triangulate their vital sign monitoring with their understanding of the telehealth service's likely response to readings that fall out with set parameters. They make their own judgement on whether the response is necessary and welcome or would be a nuisance and enter vital signs readings accordingly.

Reflecting on the way users develop new processes to submit data, as well as learn about data and adapt themselves to fickle machines, we can see functional adaptations as an attempt to shape the technologies' use within the complexities of patients' life worlds. Rather than just entering data, patients had to make adjustments and understand what was 'useful' about the data for themselves and the service provider and adapt their use of machines accordingly. Through using the machines, patients extend their competencies and gain a foothold in technical processes of care. Functional adaptations can therefore be seen as a form of boundary work altering the technological boundary between dominant understandings of (in-)appropriate use of technology-enabled service interfaces according to the institutions that characterise the

patients' life world and the system world of healthcare. These themes describe user-machine interactions. The following section describes how digital interfaces are utilised to customise healthcare service interactions with service workers.

#### 4.2. Relational adaptations

Another category of adaptations centres on the personal interactions with staff within the healthcare system. Relationality, which has been described as 'the intersubjective relatedness between one person ('I') and an Other [...] that is actualised in the interaction space of their co-actions' (FitzPatrick, Varey, Grönroos, & Davey, 2015, p. 464), is central to these processes, hence we label them as relational adaptations. Participants incorporate these adaptations into their service exchange work to re-present and re-situate their relationships with multiple actors in the healthcare ecosystem. The following subthemes also evidence how participants engage in boundary work toward re-drawing the demarcation between actors and domains of knowledge and work (Gieryn, 1983).

##### 4.2.1. Enacting effortful 'sick role' processes

Participants commonly describe coming to understand their usual relational processes of care, associated with occupying the traditional 'sick role' (Parsons, 1951) of obedient patient to be treated by expert healthcare professionals. For example, participants describe extensive experience of being routinely disturbed by having their 'obs' (clinical observations) done. In hospital the nurses are 'always coming at you with their machines' (Rachel, 68), waking you in the middle of the night (Phil, 59), leading to general sleep deprivation, which combined with dehydration, strong medication and restricted diets makes being hospitalised physically exhausting (Peggy, 83). This is an example of participants' experience of conflict with the managerial and professional perspectives interfering with emergence of subjective value during service exchange. Within the hospital setting, participants are relatively constrained from reducing the negative effects of these interactions without explicit resistance or avoidance of treatment prescribed by the system logic, and thereby violating the norms of the sick role.

Although most participants try to cooperate with doctors and nurses, they report that it can be effortful to maintain the sick role relationship by acting in accordance with conventional behaviours to receive care. The next example shows how patients anticipate their role to respond to questioning.

*I always [bring a printed medical history] because if you've got to go to hospital, [...] and you forget, so I think if I write it down, then I know, [...] but it's [remembering] your operations [...] that confuse you. [...] You can't always think, I mean it's like the heart [nurse?] will go: 'Are you sure? I don't think we'd done hearts [in that hospital].'* You know what I mean? It's like you're a liar.

(Elizabeth, 77)

Elizabeth describes pressure to produce on demand an accurate medical history with dates and locations of previous operations. Because being challenged is unpleasant, she assiduously avoids it in future by carrying a written health record with her. Elizabeth illustrates how participants anticipate effortful interactions as part of the process to co-create expected system value. As a form of boundary work, compliance maintains the demarcation between patients and professionals and deviation challenges it (Zietsma & Lawrence, 2010).

##### 4.2.2. Critically reflecting on processes and outcomes

An important theme in patient accounts is the frequency of negative service experiences that results in reflection and questioning of the sick role as a challenge to professional authority at an individual or holistic level. For example, when patients recall mundane and critical service failures that are a facet of multi-interface interactions, they can be

rejecting the care from an individual, a ward, a hospital, or a medical procedure or medics generally as illegitimate. This form of work is cognitive and behavioural, as our analysis revealed a key aspect of participants' relational adaptations involved challenging their sick role. This occurred through advancing their expertise, informed by the life world's meaning making systems, as authoritative. Thus, participants appear to be challenging professionals' monopolisation of the service exchange.

Problems with the service exchange often involved conflict when participants describe enacting the sick role and needing to adapt to the reactions of service workers. For example, participants often link negative service experiences with their perception of communication styles, medical treatment and interpersonal interaction that are typical in clinical spaces involving different actors and interfaces for service exchange. Notably, participant accounts include problems accommodating the system response to their own well-intentioned behaviours, e.g. when they try to reproduce system institutions. Elizabeth's account illustrates this as she explains getting blood iron transfusions in the hospital Haematology Unit.

*... they're dealing with people all of the time, in and out, right? And I sit in the chair and I watch, and I'll say to the nurse: 'Do you mind changing your gloves?' And she'll say: 'Pardon?' I'll say: 'Do you mind changing your gloves?' [explaining the nurse's exasperated reaction] 'You are the last ... Miss Know-all, here.' [...] And I'll say: 'I'm not Miss Know-all. I'm watching my health. You should know that.' And they don't like it! So they all look at you as if much as you're an old trouble maker and it's not, it's wrong. There's what all these adverts are about, isn't it?*

(Elizabeth, 77)

Elizabeth is susceptible to serious infections so she asks the nurse to change gloves before handling her line. She thinks prevention is possible through avoiding cross-contamination with other sick patients. Her request illustrates how patients try to act in accordance with good practice advice displayed on public health posters around the hospital, which address everyone in the hospital environment to actively prevent spreading infections. However, Elizabeth's interpretation is that the nurse's perception of her request is that she is misbehaving, causing trouble by overstepping the normal patient role by telling the nurse how to do her job. In other words, she is violating the norms of behaviour dictated by roles for patients and professionals in clinical spaces. This highlights how accepted practices maintain relational divisions between actors (e.g. distinguished by professional grade, ward specialism, patient group, etc.), and are legitimised by system structures informing interactions. Through questioning the basis of institutionalised behaviours and attitudes, participants engage in boundary work to challenge divisions of work and responsibility by trying to adapt to perceived changes to characteristic service system processes and outcomes.

#### 4.2.3. Asserting autonomy to influence care received

This subtheme shows participants using telehealth to insinuate changes to service interactions that enable them to assert their autonomy. Hospitalisation makes participants wholly dependent on healthcare providers to do everything for them. For example, they lose autonomy over what food, drink and medicines are administered; when and where they will be seen; what kind of care they receive, and by whom. At home, participants focus on regaining control over normal activities in their usual spaces including telehealth use.

Participants indicate that they endeavour to execute tasks dictated by roles and relationships for effective service exchange and, as telehealth users, they comply with the patient monitoring routine demanded by healthcare relationships. They widely recognise that collaborative tasks are central to these activities. They undertake this work by answering, helping, being available and agreeable, accepting treatment, doing the work that is required, and showing gratitude, with the purpose of feeling cared for and supported by their usual healthcare

providers. For example, Peggy explains her habit of writing down her telehealth observations on a scrap of paper to share with her visiting nurse because it's faster than using the telehealth when she's there.

*I always write it down. [...] And I mostly do it because sometimes if Stephanie pops in, she just says to me, 'What was your weight this morning?' and 'What was your blood pressure?' So, I keep an eye on it.* (Peggy, 83)

Peggy's case shows interest in telehealth is to improve interactions with the visiting heart nurse. She explains that she accepts telehealth because it 'helps her and me'.

Relational adaptations therefore involve finding respite from the sick role's requirements, with participant efforts to maintain autonomy achieving traction because telehealth use takes place in non-clinical spaces. As participants integrate processes that reproduce healthcare system practices at home with telehealth, they alter the distance between professional and patient built upon claims to expertise, and integrate patient opinions into the logic of clinical care. They do this by making the numbers (vital signs) reflect the way they feel. In introducing intentional or accidental errors to the healthcare practices (e.g. using functional adaptations), participants routinely integrate their lay interpretations of clinical data and symptom monitoring into system processes, including collaborating with provider efforts to use scarce resources conservatively as long as they also benefit. Such micro level interferences and deviations to healthcare monitoring processes affect the foundational integrity of the practices that inform them, which we describe as translational adaptations. This is linked to patients' claims to authority to legitimate their condition and evidence their healthcare needs, and is inherent to the translational adaptations in the following section.

#### 4.3. Translational adaptations

A third category of adaptations reflects participants' efforts to infuse clinical spaces with the life world perspective to improve responsiveness to their search for value. We label these translational adaptations, as they involve translating activities, values and practices from one space to another. One way in which participants make translational adaptations is by building understanding of perspectives that characterise the health service domain and seeking to assimilate or refine them in accordance with their life world perspective. One example of this is patients' expression of the need for efficiency. Another way is to interfere with system logics and processes so that they more adequately reflect life world institutions.

##### 4.3.1. Aligning lifeworld and service systems to make interactions meaningful

When participants reflect on outcomes, they evaluate them according to their life world perspectives but also through their perception of system priorities. As such, they attempt to achieve balance between their needs (phenomenological value) and those of the system in which their interactions are embedded (relational value). What is striking is that rather than rejecting 'efficiency' as a property of the system world, patients often seem to reflect on the need for efficiency and adopt an efficiency orientation integrated with their right to care. The following illustrates participants' shared awareness of the high demand for healthcare and urgent need to conserve resources through identifying ways of eliminating wasteful processes.

*I know they [are] all busy. I know they've got a lot of people there [in the Accident and Emergency Department]. But for what they did for me, they could have done it more or less straight away [instead of keeping him waiting for 11 hours].*

(Russell, 82)

Russell describes how quickly he was diagnosed by Diabetes Nurses who prescribed changes to his insulin regimen. He suggests it would

have been more efficient to treat him first and be sent home, rather than being assessed as non-urgent and made to wait because, as a junior doctor apparently shouted at him: *'These beds are for people who are dying, not for people with blood sugar trouble!'*. The next quote shows Russell trying to cancel a duplicate heart scan.

*I phoned up and the receptionist said, 'Well, actually, [the doctors] ordered one for you.' I said, 'But I don't need one. I've already got one on the 20th.' And she says, 'Well, we can't really cancel it because—' And I said, 'Well, don't you think that's going to waste somebody's time and money when I've already got one?'*

(Russell, 82)

Russell appears here to be concerned with improving system efficiency by reducing waste; however bureaucratic rules prevent patients from having authority to allocate hospital resources. His frustrated attempts to co-create system value highlights tensions resulting from openly breaching boundaries and overstepping roles. Russell's case illustrates that some patient interactions are also characterised by their attempts to assume certain organisational ways of thinking in order to interact effectively, even in highly frictional modes.

#### 4.3.2. Integrating different socio-technical actors to co-create subjective value

Participants integrate resources from a combination of system and life world activities and perspectives. Their hybrid approach integrates, aligns and combines entities (machines, places, services, metrics, practices, processes, healthcare teams, machines, social ties, other patients, wider populations) to justify decision-making and value determination, to improve service relationships and to address asymmetry between system and life world perspectives that creates conflict. Changing monitoring processes involves reconfiguring the use of socio-technical actors as resources to improve interaction outcomes. This involves making collaborative use of social ties. For example, participants who are frustrated by using fickle machines feel they derive less value from using telehealth than they provide for others. Achieving balance is important to patients, as shown by the following quote in which Julia defends her actions and decision-making processes when using telehealth. She does this by drawing upon the aim shared by patients and providers to use telehealth to save clinical appointments for more serious cases (again highlighting how certain ideas are shared between life world and system perspectives).

*...when I saw the reading I thought, [...] there will be a call, because that's how they check on you every day... my weight can go up and down for no apparent reason, because I'm doing nothing, and so [...] if my oxygen level drops, then that registers as well, and it dropped to 88 the other day, and they said, 'You should have called us in,' and I said, 'No, I'm fine.' [...] I says, 'Look, [emphatically] I'll phone you when I know that I need a nurse, or a doctor.' [...] 'If I'm ill, you know me, I'll press [...] my little red button ...'*

(Julia, 68)

This excerpt illustrates how the telehealth process can reproduce the authority of the system perspective in a person's home (i.e. a reading of '88' objectively means, *'You should have called us in'*).

However, Julia's quote also shows how she exerts some control over care decisions by determining the appropriate service response according to her subjectively perceived need for care. This involves customising usage with processes that upset the intention of telehealth's machine-based analysis of objective indicators of need for care. However, Julia's relational adaptation also involves managing the relationship positively to ensure she does not alienate her healthcare providers. So, although Julia describes regularly overriding telehealth alerts, potentially overstepping the legitimate patient role, she does so confidently in the knowledge that she can arrange for help if needed in various ways, selectively reproducing the system's logic by mentioning the recommended routes for engaging with the service. She exemplifies

translational adaptation, skewing interactions to be meaningful according to life world perspectives.

Reflecting on the above translational adaptations, these can be seen as a form of boundary work that expands patient authority - to the extent of claiming allocative authority over scarce healthcare resources, a domain over which professionals guard their claim to legitimate jurisdiction - and also to rework the boundaries between conflicting institutional arrangements. We observe participants working to understand their healthcare interactions by combining clinical and lay language, deciding what information is shared, describing trade-offs when participating in healthcare interactions, and when curtailing interactions to conserve resources for others. Linking through the combination of functional and relational adaptations, we observe participants introducing accidental or purposeful data input errors, imperfectly reproducing practices and perspectives characteristic of the system's institutional arrangements in order to exert control and shape service exchange so that the outcomes sought are meaningful to life world perspectives.

We suggest this exemplifies translational adaptations by actors inhabiting overlapping ecosystems. Participants adapt to field level institutional arrangements as they endow them with local meaning (Hallett & Ventresca, 2006). As boundary work contextualised to an expert service, we observe translational adaptations as negotiation of conflict between multiple healthcare system and life world institutions in order that service interactions reflect divergent institutional arrangements more equitably. Distinct from functional adaptations and relational adaptations, which involve more modest inroads into the health providers' monopoly over service exchange logics, translational adaptations more abstractly show how field level institutions shape interactions that are interfered with at the micro level. Translational adaptations as processes of boundary work can be seen to challenge foundational system processes to co-create value when they fail to appropriately integrate life world perspectives.

## 5. Discussion

Our investigation of service exchange explores how actors co-create value when they confront conflicting institutional arrangements. We acknowledge that institutional structures tend to favour certain actors (Bone et al., 2014) and argue that, in many service exchanges, customers are marginal organisational actors likely to experience tensions between conflicting institutional arrangements characterising the service system and their own life world. To illuminate customers' dynamic, adaptive processes, our empirical study centres upon the introduction of the telehealth technology. Primarily this involves patients taking up the work of monitoring and reporting vital signs, which they carry out in their own homes. Due to changes to linked service processes (May, 2015) the introduction of the new technology also affects service exchanges for diagnosing problems and decision-making on healthcare needs and access. We introduce the idea of boundary work (Zietsma & Lawrence, 2010) to explore how patients' efforts, as they respond to novel service configuration, define and disrupt the institutional boundaries between the health system and their own life world. We consider how this shapes service exchange for these focal service processes as well as the ripple effects on patients' interactions within the healthcare system more broadly.

A major driver for the introduction of the new technology by the health service organisation was to improve efficiency of patient management at the system level. Our findings illustrate that patients, for their part, seek to co-create value that is meaningful in the context of their own lives and try to balance it with the needs of the service system. However, in doing so, they perceive tensions between the institutions of the health system and their life worlds to which they respond through functional, relational, and translational adaptations.

Functional adaptations relate to use of the telehealth to monitor and report vital signs on their health condition. The telehealth service

provides training to new users at installation, but there is heavy reliance on the simplified machine interfaces to guide patients. However, patients do not experience their interactions with this service interface as a straightforward ‘task’, rather they find tensions between the health service system (seeking objective patient measurements) and their own life world (seeking diagnosis and service that aligns with their own perspective on value). We find that patients engage in functional adaptations, which are micro level processes by which they comply, deviate, innovate and/or collaborate with the service organisation as they try to resolve the tensions in service exchange and co-create value (which may or may not align with what patients want with what they need (Berry & Bendapudi, 2007)). Our findings suggest that restructuring the work of service exchange, and giving these tasks over to customers, opens up considerable scope for them to do the work in diverse ways and reshape it in line with their own, contextualised perspectives on value (Helkkula et al., 2012b). The fact that much use of telehealth (and other digital interfaces) is remote, beyond the gaze of service staff, is an added factor in creating the opportunity for people to customise their use, individually and in collaboration with other influential actors, as they ‘domesticate the technology’ (Pols, 2012). Arguably, digital interfaces are spaces where ecosystems overlap (Simmonds & Gazley, 2018) but where customers’ disruptive innovation escapes pressures to conform. In these spaces customers can use various means to influence service exchange rather than directly challenging incumbent practices through recourse to alternative logics (Gieryn, 1983; Scaraboto & Fischer, 2013). Viewed as a form of boundary work, some of the adaptations that we found serve to extend the scope of patients’ work and their control over the roles and resources within service exchange. However, while some participants shape their work with a sense of empowerment, others (especially those who lack relevant knowledge) inadvertently change service processes (e.g., as they attempt to mimic professional practices) as they seek to improve their situation, but they do so with a sense of uncertainty that is accompanied by feelings of anxiety about the service exchange and their healthcare. Many of the latter group remain uncertain about their actions and rather than expanding the role they regularly reach out for support and feedback from trusted healthcare providers.

Relational adaptations centre on personal interactions with service staff. Patients vary in the extent to which they seek to reshape their relationships with these actors in the course of their efforts to integrate telehealth use into the healthcare process. In our research, a particular feature of this relational work concerns patients’ efforts to either conform to and/or challenge the ‘sick role’ (Parsons, 1951) and the professional authority that governs the care that patients receive. As patients seek to realise the benefits of service exchange, they submit to or resist what they perceive to be a subordinate role within the institutional context. They use combinations of relational adaptations (e.g., enacting prescribed processes, adopting an efficiency orientation, using accurate and erroneous evidence generated by telehealth monitoring, conveying reflexive expertise) to influence staff to view them as responsible, cooperative patients with valid care needs. The more patients are inclined to challenge the sick role, the greater effort they devote to legitimizing their role in questioning decisions about their care. The nature of these adaptations suggests that protecting autonomy is a primary purpose of the relational boundary work for service exchange in this context. Whereas prior research into boundary work highlights that people in work contexts use it as a way of protecting their autonomy (Kreiner, Hollensbe, & Sheep, 2009; Llewellyn, 1998), in the context of this service exchange we see that the more empowered patients make clear efforts to protect their autonomy over their bodies and lives.

Translational adaptations capture participants’ efforts to bring to the fore their own perspectives on value within service exchange by suffusing clinical spaces with concerns from their own life world. We found that patients combine functional and relational adaptations, deviating from and interfering with the institutional arrangements

characterising the service system to push for better alignment with and assimilation of life world concerns. Through the micro level processes inherent to these adaptations, patients can make quite fundamental changes to critical monitoring processes that make up this service exchange. As boundary work, they interfere with the delineation between actors inscribed within telehealth service scripts and we venture that, through these individual level adaptations, there is potential to instil change at the practice level by rebalancing system and life world approaches. Previous studies have considered the use of tactics to achieve ‘an ideal level and style of [...] segmentation or integration’ of conflicting institutions including leveraging technology (Kreiner et al., 2009) to balance roles (Burri, 2008; Carton & Ungureanu, 2018; Desrochers & Sargent, 2004; Kreiner et al., 2009; Lindberg, Walter, & Raviola, 2017; Mikes, 2011). We contribute to services research insight into how remote interfaces facilitate value co-creation by affording adaptations and deviations from standardised interactions rather than imposing constraints typical in self-service technologies and expert services that delineate front and back office roles (Dabholkar, 1999; Seiders et al., 2014). Focusing on boundary work to redefine these roles can help services to visualise what ‘balanced centrality’ (Gummesson, 2008) in service exchange looks like in dynamic contexts and guide customer-led Transformative Service innovation.

Our interpretation of patients’ adaptations as boundary work (Gieryn, 1983; Zietsma & Lawrence, 2010) highlights that their work takes shape as they seek to better integrate concerns from within the patients’ life world into the service exchange. Goals of boundary work found in other contexts, most notably expansion and protection of authority (Lamont & Molnar, 2002; Phillips & Lawrence, 2012), are evident here. In this context primary goals are expansion of the patient role and protecting patient autonomy over their health as an integral part of their lives (Burri, 2008; Gieryn, 1983). However, patients combine these forms of boundary work with more compliant processes to enable smooth interactions with the healthcare staff upon whom they rely. The nuanced and challenging nature of boundary work to navigate contradictory institutional arrangements, may account for the experience of effort in healthcare interactions (Sweeney et al., 2015).

Following from the above, our findings draw attention to the way in which contradictions between institutional arrangements create opportunities for value co-creation. The service ecosystem concept joins actors and social structures without necessarily describing how these entities overlap with adjacent ecosystems influencing service exchange (Edvardsson, Kleinaltenkamp, Tronvoll, McHugh, & Windahl, 2014). By applying the boundary work perspective our study adds specificity to institutional arrangements that matter because they show how customers respond to experiences of smooth or conflictual interactions. Our empirical study, focused upon customers, illuminates how conflicts between multiple institutional arrangements are experienced and stimulate boundary work that incrementally interferes with service system practices. Prior literature notes that as conflict intensifies interactions, increases information flow and challenges assumptions (Gadrey & Gallouj, 1998), it can lead to more extensive innovation as actors use translational adaptations and skew interactions to reflect what is meaningful in the life world. Whereas previous literature has linked misalignment of practices between providers and customers with failure to co-create value (Skålén et al., 2015), our study suggests that there is also potential for imperfectly reproduced practices to reinforce provider-customer relationships through conflictual interactions that question taken for granted assumptions. As interactions at organisational boundaries by peripheral actors are shown to imperfectly reproduce field level institutions, when actors routinely exploit opportunities afforded by digital interfaces to switch between upholding and violating practices underpinning the sick role foundational to healthcare service interactions, we show how marginal actors inhabit field level institutions and engage in boundary work in order to co-create value (Dolbec & Fischer, 2015; Hallett & Ventresca, 2006; Scaraboto & Fischer, 2013).

### 5.1. Managerial implications

Our study suggests customers draw on their previous experiences to adapt the interactions that underpin service exchange in expert services. Adaptations increase their sense of control over the intensity of interactions and the quality of outcomes in service exchange, especially when interactions are difficult, confusing, or do not meet expectations. Perceived value is, then, affected by customers' scope to alter usual processes to meet their immediate and future needs, especially when defection to alternatives is impossible because of high dependency. Technology-based services allow customers to protect their autonomy to decide the intensity of service interactions across a multichannel service relationship.

How value is derived from technological innovation is central to contemporary concerns of health care management and policy. At a global level, service providers are currently faced with rapid growth in uptake of digital interfaces. This study suggests understanding value needs to go beyond narrow measures of health outcomes, to consider the motivations, life circumstances and choices of service users themselves. This poses an inherent challenge, as it requires organisations to balance management of risk at the population level, with heterogeneous service requirements at the individual level. Rather than an immediate route to improved efficiency, successful implementation of healthcare technology therefore requires service models which allow deepened understanding of, and relationships with, service users. As telehealth services become mainstream through multichannel healthcare systems and a growing market for direct-to-consumer versions, it is important that managers understand the drivers of customer choice between service channels and their desire for propositions that offer technology-mediated alternative interactions. Explicitly, in contrast to management and policy to shift the work and costs of care onto self-care technologies, the uptake of new technologies could instead be seen as an attempt by consumer-patients to gain control over boundaries of access to healthcare services. Managers must also recognise the toll that dysfunctional relationships with healthcare takes on customer well-being has implications for system value through customer and staff retention problems.

We suggest further work is needed to understand what types of intervention are best suited to addressing the experience of conflict preceding functional adaptations. Indeed, based on the study's findings, we recommend managers focus on supporting digital interface customers who may be trapped in the functional and relational types of boundary work, as they appear to involve more work and less added value compared to users that evidence processes of translational adaptation.

### 5.2. Limitations and further research suggestions

Our findings are based on a small sample and focus on explaining the customer perspective of a single telehealth service that shows how actors adapt to changing environments. Given institutions shape and are shaped by actors, we infer potential for changes to service structures at the meso level if not wider level social change. Longitudinal studies would be better equipped to study how use of digital interfaces involve novel practices and ecotone formation (Simmonds & Gazley, 2018) that eventually are perceived to challenge incumbent practices. Further research is needed to assess the likelihood that the bottom-up changes to healthcare interactions afforded by the boundary work shown here leads to the establishment of practices and potentially to wider institutional change and market formation. There is considerable need for research in other contexts to understand these effects (Ostrom, Mathras, & Anderson, 2014).

### Acknowledgements

This work was supported by the Economic and Social Research

Council grant number ES/J500100/1.

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