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Fostering Actor Engagement Through Human Centered Service Design (HCSD): Lessons Learned from the Cross Domain Examples of Service Dominant Architecture

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ABSTRACT

The research question of this work is "how to foster actor engagement with the help of Human Centered Service Design (HCSD)". Based on the foundations of Service-Dominant Logic (Vargo and Lusch, 2018), Service Science (Spohrer et al., 2019) and Design Science (Papanek and Fuller, 1972; Peffers et al., 2008), in a first step the building blocks of HCSD are elaborated. In a second step the relevance of the building blocks is analyzed in the context of actor engagement. The key findings are used to develop a set of explicitly applicable solution pattern for promoting actor engagement (Peffers et al., 2008). Finally, the relevance of the developed solution pattern is demonstrated using cross domain examples of Service Dominant Architecture (SDA).

Keywords: Human centered service design, Actor engagement, Interaction, shared capabilities, Composable architecture, Service dominant architecture

MOTIVATION

The research question of this work is "how to foster actor engagement with the help of Human Centered Service Design (HCSD)". Humans become actors by engaging in situations linked to value propositions as potential outcomes. They consider the costs and benefits of various behaviors and take actions according to their personal disposition their preferences and the potential outcome (Rudd, 2004; Ostrom, 2005; Ostrom et al., 1994). This work examines how Human Centered Service Design can be used to support and facilitate the engagement of human actors in service exchange. Based on the domain theories the building blocks of Human Centered Service Design are elaborated and analyzed in the context of actor engagement. The findings are used to develop generic solution pattern. Finally the relevance of the solution pattern is demonstrated on an cross domain examples of Service Dominant Architecture (SDA).

METHODOLOGY

Referring to our research question we apply a combination of the Design Science Research Methodology (DSRM) and cross domain examples. Design Science Research Methodology (DSRM) is applied because it adresses the

design process as an "act of creating an explicitly applicable solution to a problem" (Peffers et al., 2019). To gain a better understanding of the relevance of the solution (pattern) created we complement the DSRM with cross domain examples (Yin, 2018; Bass, nd). Referring to DSRM (Peffers et al., 2019) our research proceeding is divided into six activities which are presented in the following.

Activity 1: Problem Identification and Motivation: How can organizations foster actor engagement with the help of Human Centered Service Design?

Activity 2: Define Objectives of a Solution: Our goal is to define the core elements of actor engagement as building blocks of a generic solution pattern.

Activity 3: Design and Development: According to the understanding of Design as "the conscious and intuitive effort to impose meaningful order" (Papanek and Fuller, 1972) in this step of the DSRM, the building blocks are put into a purposeful structure as design pattern (Peffers et al., 2019).

Activity 4: Demonstration: The demonstration of the solution is based on cross domain examples of Service Dominant Architecture (SDA). For this purpose, different examples for the application odf SDA are analyzed to demonstrate the relevance of the building blocks for actor engagement.

Activity 5 Evaluation: The evaluation of the cross domain examples examines to what extent HCSD is suitable for fostering actor engagement and achieving the objectives of solution.

Activity 6: Communication: Our work results will be disseminated in the relevant scientific and practical community.

DOMAIN THEORIES

Based on a research of the domain theories and concepts of Service-Dominant Logic, Service Science and Design Science, the core building blocks of HCSD (Wieringa, 2014; Imenda, 2014) and Actor Engagement (Storbacka et al., 2016; Blasco-Arcas et al., 2020) are elaborated. In a second step, solution patterns for the fostering of actor engagement are designed from these.

Service-Dominant Logic (S-D Logic) is a meta-theoretical framework for explaining the process and narrative of value creation through service exchange among multiple resource-integrating actors forming institutionally coordinated service ecosystems (Vargo and Lusch, 2018; 2004). Service Systems and Service-Dominant Logic are the key constructs of Service Science (Maglio and Spohrer, 2008; Spohrer and Maglio, 2010). The core principles of Service Science center on how value is created among entities, how interaction depends on access to resources and capabilities, and on how value-creation depends on the context of mutually agreed upon value propositions (intention) (Maglio and Spohrer, 2013).

Both from the perspective of S-D Logic as well as from the perspective of Service Science human actors engage for the creation of value understood as positive valanced change in well-being of others, themselves or a particular system. Incentivated by value propositions - as potential value - humans engage in an interactive process of resource integration and service exchange within polycentric service (eco) systems. Service as the application of resources for the benefit of another actor or oneself is the fundamental basis of

Table 1. Building blocks of human centered service design.

HCSD	Human Centered Service Design	Ref.
human (actor)	–humans as carrier of operand and/or operant resources; – as actors humans are capable of acting on potential resources to cooperate by cocreating value, either positively or negatively valanced	(Vargo and Lusch, 2018; Löbler, 2013; Danatzis et al., 2021)
human centered (value proposition)	– humans as socio-economic actors who connect through value propositions within "complex Service Systems" and perform actions aimed at reaching desired outcomes – as approach that intents to co-create positively valued changes in human well-being by shaping service exchange	(Spohrer et al., 2019; 2008; Warg and Deetjen, nd; Wieland et al., 2012)
service (exchange)	– as the application of resources for the benefit of others or oneself – service exchange as a reformulation of the foundational unit of exchange – shifting from an emphasis on the exchange of goods-for-money to service-for-service – in which service is broadly defined as applied skills and knowledge	(Vargo and Lusch, 2018; Maglio et al., 2015)
design	– as act of creating an explicitly applicable solution to an problem; – as the conscious and intuitive effort to impose meaningful order	(Papanek and Fuller, 1972; Peffers et al., 2008)

exchange and thus of cooperation and capability-sharing (Vargo and Lusch, 2018; Storbacka et al., 2016; Maglio and Spohrer, 2008; Ostrom, 2010).

Value is always uniquely and phenomenologically determined by the human beneficiary. Accordingly, the respective benefit depends on the individual context of the actor; that is, on his situation, position and disposition (Vargo and Lusch, 2018; 2004; Coleman, 1990; Reckwitz, 2002; Brodie et al., 2019). Actors can in particular positions – as placeholders for authorized sets of action - take actions. Action situations are the social space where participants with diverse preferences interact, exchange goods and services, solve problems or dominate one another (Ostrom, 2005; Ostrom et al., 1994).

From a service perspective Design Science is understood as explorative approach to creating novel forms of value co-creation (Vink et al., 2019). In order to be human centered service design the creative act and its results must serve human needs (Goodwin, 2011; Warg, nd). In this context, design contributes by providing meaningful order, structures, and patterns that are constitutive because they are both medium and outcome of value co-creation (Papanek and Fuller, 1972; Giddens, 1984).

BUILDING BLOCKS OF HCSD, ACTOR ENGAGEMENT AND DERIVED SOLUTION PATTERN

This knowledge and understanding of service and service design leads to the following definition for HCSD: Human centered service design (HCSD) seeks

Table 2. Building blocks of actor engagement.

HCSD	Actor Engagement	Ref.
human (actor engagement)	– human action in recourse to individual purposes (homo economicus) to social norms (homo sociologicus) or in recourse to implicit or unconscious, collective symbolic structures (cultural theory) – human actor engagement as participating in action situations by interacting and applying resources	(Ostrom, 2005; Ostrom et al., 1994; Storbacka et al., 2016; Blasco-Arcas et al., 2020)
human centered (value propositions)	– value is co-created by many actors always including the beneficiary – as the process through which multiple actors, often unaware of each other, jointly contribute to an humans wellbeing – as potential value, or benefit, associated with a service provision	(Vargo and Lusch, 2018; 2016; Lusch and Nambisan, 2015)
service ((eco) systems)	– human-centered Service Systems as configurations of people, information, organizations, and technology that operate together for mutual benefit. They depend critically in sharing capabilities among distinct economic entities to increase joint value – a relatively self-contained, self-adjusting system of resource-integrating actors connected by shared institutional arrangements and mutual value creation through service exchange	(Vargo and Lusch, 2018; 2004)
design	– meaningful order of capabilities – assures the desirability and effectiveness of the Service System	(Vargo and Lusch, 2016; 2008; Lusch and Nambisan, 2015; Spohrer et al., 2017; Foundation, 2014)

positively valuated change in human well-being through the shaping of a meaningful order facilitating service exchange in actor-to-actor networks (Warg and Deetjen, nd). In the following, the properties originating from the domain theories are assigned to the building blocks in Table 1.

From the perspective of actor engagement, the building blocks of HCSD can be specified as in Table 2.

These building blocks are used for distilling a set of solution pattern for promoting Actor Engagement:

Pattern for interacting (human actor engagement)
institutions for interaction as application of resources
connectivity and interoperability within actor-to-actor networks
high degree of openness
Pattern for building (co-producing) value propositions
institutions for resource integration (data, AI, et. al.)
enhance resource density
co-production of value propositions
"architecture of participation"
meaningful order of capabilities
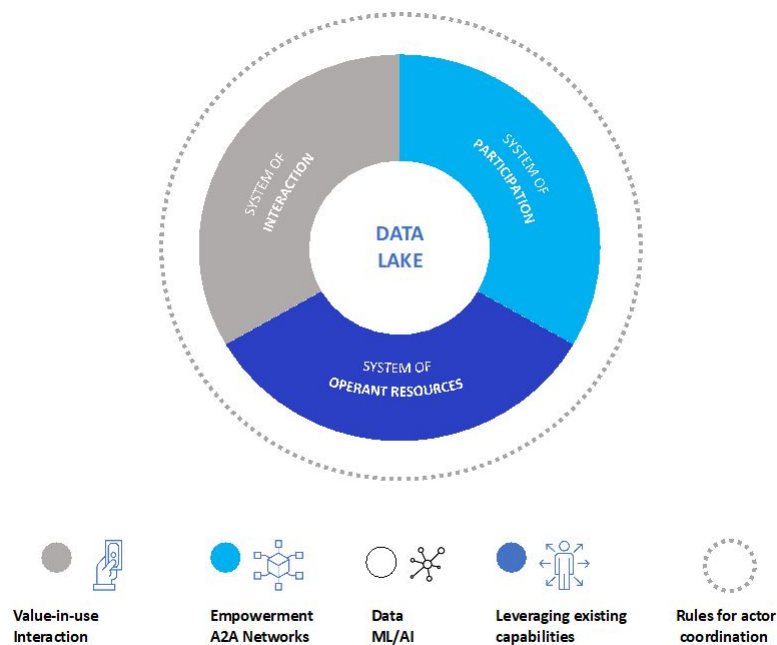
Figure 1: Service dominant architecture.

Pattern for orchestrating resources and capabilities
institutions as shared rules for cooperation
resource integration and service exchange value in use
service systems (entities) as facilitator of mutual value creation
The relevance of the solution pattern is analyzed with cross domain examples of SDA.

CROSS DOMAIN EXAMPLES OF SERVICE DOMINANT ARCHITECTURE

SDA is grounded in S-D logic and Service Science and provides an organizing logic for shaping Service Platforms and Service Ecosystems. The SDA design pattern intend to build and orchestrate capabilities in a systematic way. That allows for more rapid change and adoption of new technologies, including AI, to accelerate the Digital Transformation and to turning resource density into service innovation. The purpose is to make businesses better – more agile, more sense-and-respond, better able to keep up with and drive meaningful human centered change in a fast-paced world. The architecture consists of five Service Systems (Fig. 1):

- System of Interaction: enables real-time interaction between customers, providers, and other stakeholders
- System of Participation: enables the integration of external capabilities, solutions, services

- System of Operant Resources: enables the strategically relevant capabilities to be built, combined and included in the solution (value) creation process
- System of Data (Data Lake): enables building a data-based customer understanding from interaction
- System of Institutions (SDA Service Catalog): The systems are supplemented by rules (institutions) that coordinate actors and enable or limit access to capabilities.

Example Stroke Prevention

Ai4medicine is a personal health advice service for stroke prevention (Zolnowski and Frey, 2020). The underlying prediction model was developed with machine learning algorithms based on clinical data of Berlin Charite from patients with an increased risk of stroke. Stroke prevention offers both a high patient benefit and opportunities to improve customer relations for partner companies. Using SDA partners such as insurance companies can provide historical health data of the customer to further improve data quality. Actor engagement is fostered by institutions like interoperable health data such as Health Level 7 (HL 7) or Fast Healthcare Interoperability Resources (FHIR). This way weareables, for example, are connected and integrated. This eliminates the need for the user to manually enter the data. In this manner SDA facilitates actor engagement and interacting with connectivity and interoperability.

Example Claims Management

A claim is an event in which customers expect immediate feedback as well as fast and uncomplicated help - a "moment of truth" because customers have taken out insurance for this situation. From "zero to one hundred", insurance companies have to prove that they are a reliable partner in these often emotional moments.

The expansion of digital service experiences requires the leveraging of existing - and the integration of external capabilities - from chatbots and authentication processes to integrated payment service providers and direct assistance services. Technical connections of external partners and their solutions as well as the application of artificial intelligence must be ensured in order to benefit from the cost potentials through higher degrees of automation. Processes must be scalable - as demonstrated by the pandemic and the flood disaster in Germany. "Classic" scaling, such as increasing staff, for example in call centers, is not an alternative in such extreme situations. Based on SDA platform, the insurer SIGNAL IDUNA Group has created a market-leading customer-centric service experience. All services are modular and composable. This ensures that external partners can be connected quickly and easily via standardized APIs, while cloud-based solutions enable the scalability of processes - and all this has already proven its worth in the context of the severe weather catastrophe "Bernd" (SDA SE Open Industry Solutions, nd; Hans, 2021).

Example Mobility

The three German motor insurers HUK-Coburg, LVM and HDI insure together around 18 million vehicles, which is just under a third of all vehicles registered in Germany. They are founding a new mobility platform to offer their customers services related to driving - outside of insurance. These can include workshop services and general inspections as well as financing a car or buying a used car. With the help of artificial intelligence, the platform aims to make customers offers that are precisely tailored to their needs. The platform enables insurers to integrate and combine non-insurance services quickly and seamlessly (Fromme, 2021). App store as a role model. The services offered by the mobility platform can be created just as easily as in the app store. This is made possible by the Service Dominant Architecture and its service catalog as pattern for resource density and value propositions (Fromme, 2021a; 2021b).

EVALUATION AND FINDINGS

This work demonstrates from a theoretical and practical perspective the relevance of HCSD for actor engagement. Actor engagement is supported by HCSD in the core-perspectives of participation, interaction and co-production; institutions are particularly important in this regard. Actor participation is promoted by institutions allowing openness and connectivity e.g. technical standards like APIs. Interaction is supported with institutions enabling resource integration and service exchange applying e.g. standards for health data exchange. Co-production of value propositions is driven by resource density opening up the opportunity of new combinations of capabilities and thus innovative value propositions as further incentive for actor engagement. Institutions are particularly important in fostering actor engagement by design and also to adress governance challenges in the context of service (eco) systems.

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