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Juuli M. K. Lintula
University of Jyvaskyla, juuli.lintula@jyu.fi

Tero Päivärinta
Luleå University of Technology, tero.paivarinta@oulu.fi

Tuure Tuunanen
University of Jyväskylä, tuure@tuunanen.fi

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Short Paper

Juuli Lintula, Tuure Tuunanen
PO Box 35 (Agora), FI-40014
University of Jyväskylä, Finland
juuli.m.k.lintula@jyu.fi,
tuure@tuunanen.fi

Tero Päivärinta
PO Box 4500, FI-90014
University of Oulu, Finland, and
Luleå Univ. of Technology, Sweden
tero.paivarinta@oulu.fi

Abstract

Building a versatile portfolio of public and private digital-enabled services is vital in rural and sparsely populated regions, where traditional market mechanisms alone cannot guarantee the availability of essential services. However, contemporary services tend to build on prevalent institutions, often governed by decisions based on market mechanisms, such as economies of scale – service-by-service and village-by-village. A shift is suggested towards networks of smart villages co-creating value as regional service ecosystems. We draw from institutional theory and employ the Service-dominant logic (SDL) framework in investigating value co-creation in rural villages in Sweden. Analyzing 53 laddering interviews, we derive scripts encoding institutional principles for innovating bundles of digital-enabled services. The study brings forth novel insight for e-government research and practice, and the SDL discourse therein, on outlining required institutional practices and institutional work to counteract plain market mechanisms for governing value co-creation on smart rural service portfolios.

Keywords: Smart villages, institutionalization, regional service ecosystems, co-creation

Introduction

Norrbotten, the largest region in Sweden, covers 25% of the country area, while its population represents only 2.555% of the Swedes (Regionfakta 2020). Suboptimal availability of local services affects *livability* in such rural regions in developed countries. Livability refers to the degree to which the physical and social features of a living environment fit an inhabitant's requirements and desires. High livability improves individual and community well-being (Newman 1999). Vast distances to public and private service hubs pose challenges to inhabitants. Fortunately, the Internet and fast broadband connections have become widely available allowing integration of local and digital service resources (McKinsey & Company 2014; Regionfakta 2020). Thus, opportunities for innovating smart services for inhabitants' needs have increased. For instance, on-demand delivery of goods and health services can be provided in rural regions as service constellations combining public and private services, such as a mobile service booth for distributing health and convenience services as well as appointments for unemployment services and leisure activities.

However, given the scarce municipal resources, designing, developing, and providing services for sparse village populations is challenging. Moreover, given these villages' low population densities and distance from larger cities and towns, traditional market mechanisms may not sustainably secure the availability of public or private services on site. Structures and processes at the regional, national, and global scales significantly influence the development of small towns and municipalities (Leetmaa et al. 2015, p. 148).

Thus, these services ought to connect not only individual inhabitants with government and businesses at the micro-level, but also networks of rural actors at the meso level (inhabitants, businesses, and municipalities) and municipalities at the macro level. Because each inhabitant has their personal needs, values, and goals, one service model may not fit all. Thus, an improved understanding of how to create value in regional service ecosystems is needed. We address this need by answering the following research question: How can value be derived for actors in regional service ecosystems through smart services? To attain an understanding of what is of value for inhabitants and the municipality, we employ the Service-Dominant Logic (SDL) framework (e.g., Vargo and Lusch 2004, 2016) and investigate value as an outcome of a co-creation process in which actors integrate available resources into a joint venture. Due to sparse customer bases in rural areas, transformation of the prevailing ways and means of providing and consuming services may be required for enabling such co-creation. Thus, we draw from institutional theory (Barley and Tolbert 1997) in innovating smart, sustainable services for regional service ecosystems (Vargo et al. 2015).

To understand how to create value using smart services in regional service ecosystems, we conducted qualitative interviews (n = 53) in Norrbotten County, Sweden, using the laddering interview technique (Reynolds and Gutman 1988). This method emulates the informants' mental models and provides tools for eliciting and structuring them as chains of attributes, consequences, and values (Peffers et al. 2003). We establish an understanding of the regional service ecosystem's value structures to inhabitants by constructing thematic maps of the laddering chains. We employ the concept of scripts, i.e., the "observable, recurrent activities and patterns of interaction characteristic of a particular setting" (Barley and Tolbert 1997, p. 98), and observe chains in each map as encoding scripts of institutional principles (Barley and Tolbert 1997) for value co-creation in a regional service ecosystem. Further, we depict links between institutionalization and actors' practices in the uncovered value co-creation scripts. These links manifest as forms of institutional work (Wieland et al. 2016) that may be employed in developing sustainable public and private services in smart villages for the purpose of attaining a regional service ecosystem. The findings contribute to the e-government literature with a novel investigation of the development of smart villages in rural areas capturing the interplay between higher-order scales and individual actors. Moreover, our study contributes to service research, and SDL discourse in particular, with empirical evidence of institutionalization for potential value co-creation in a regional service ecosystem. Our findings showcase that also disruptive innovations are required for co-creating value with novel combinations of digital-enabled services to maintain rural regions' livability.

Theoretical Background

The Service-Dominant Logic Perspective and Service Ecosystems

One of the main interests of service providers when designing, developing, and providing services is to determine how value can be derived from the service. Over the past two decades, research has begun to emphasize the role of customers in the creation and determination of value. Interactivity and relationship-focused perspectives have emerged, suggesting that companies ought to consider customers as active co-creators of experience and value (e.g., Ballantyne 2004; Prahalad and Ramaswamy 2000). According to SDL (Vargo & Lusch 2004) service providers may merely propose value propositions to their customers, which customers may choose to accept by integrating their resources into a value co-creation process. Here, products and services have no embedded value. Instead, value is co-created through the process of resource integration between the involved providers and customers (ibid.). In other words, SDL underscores operant resources (e.g., knowledge and skills) as primary subjects of economic and social exchange. Furthermore, institutions—the rules, norms, and beliefs set by people (Scott 2001)—coordinate the actions and experiences of individual actors, thus constraining or enabling the co-creation of value (Vargo and Lusch 2016). Accordingly, each benefiting actor determines derived value contextually and phenomenologically.

As actors integrate possessed resources, they fundamentally become connected to other actors by those resources, and vice versa. For instance, actors can build on one another's knowledge through the collective innovation of services. Such processes occur not only in dyads between two actors but also in triads and networks of multiple connected actors (Vargo and Lusch, 2016). These networks form service ecosystems, which are fundamental to understanding value co-creation (Chandler and Vargo 2011) and are defined as "relatively self-contained, self-adjusting system[s] of resource-integrating actors connected by shared institutional arrangements and mutual value creation through service exchange (Vargo and Lusch, 2016,

pp. 10-11)." Service ecosystems involve "large-scale social structures and institutions" that evolve with actors' unique service efforts in dyads, triads, and complex networks (Chandler and Vargo 2011, p. 44). Thus, to understand how value is derived by individual actors (at the micro level), it is essential to understand meso- and macro-level influences. This understanding may include institutionalized meanings of practices and public procedures. To make sense of such discrepancies in deriving value, understanding the context and acknowledging value as a contextually contingent concept are essential (Vargo et al. 2008).

Institutional Change in Re-forming Service Ecosystems

We adopt the SDL lens and view that institutional arrangements guide actors' sensemaking of service situations and the emerging value for beneficiaries in nested and overlapping service ecosystems (Vargo and Lusch 2016). The institutionalized view draws from the social systems perspective, which claims that actors draw meaning from social systems and societal beliefs and norms (Edvardsson et al. 2011). Barley and Tolbert (1997, p. 96) discuss institutions as having "shared rules and typifications that identify categories of social actors and their appropriate activities or relationships." Vargo and Lusch (2016, p. 6) offer a more simplified definition in which institutions consist of "rules, norms, meanings, symbols, practices, and similar aides to collaboration." Wieland et al. (2016) state that institutions are the glue in service ecosystems enabling and constraining value co-creation within these social systems.

Barley and Tolbert (1997) modelled how institutions are created, altered, and reproduced. They posit that "scripts" may be viewed as bridges that gauge how institutions affect actions and, at the same time, how actions iteratively maintain, modify, and create new institutions. The authors structure a methodology, stating that scripts may first be used to *encode* institutional principles in specific settings and then enacted on to maintain or enforce such principles (Barley and Tolbert 1997). In a similar vein, Wieland et al. (2016) argue that value co-creation practices, which are enacted by actors, simultaneously shape those very same practices by *creating, maintaining,* or *disrupting* the institutions that are guiding their (re)enactment. Wieland et al. (2016, p. 5) define such value co-creation practices as "sets of overlapping and interlinked bundles of integrative, normalizing, and representational practices through which actors make sense of and integrate public, private, and market-facing resources." Furthermore, Barley and Tolbert (1997) suggest that a setting that involves disturbances (e.g., new technological developments or regulations) can be particularly fruitful for observing institutional change through scripts.

Value Co-creation in Regional Service Ecosystems – Need for Institutional Work

While localizing services in sparsely populated (but highly connected) areas may be ineffective with the prevailing traditional market mechanisms (McKinsey & Company 2014), reformation of service ecosystems is needed to support inhabitants' well-being with public and private services. Accordingly, e-government research has acknowledged that future challenges require a shift in conducting and organizing innovation, embracing technological advancements, such as artificial intelligence and big data (Liu and Peng 2014; Mulder 2014). Drawing from the SDL lens, collaboration between individuals as well as public and private service providers and other stakeholders may be key for co-creating such service innovations. Previous research has attempted to obtain an understanding of technology-enabled public value co-creation (Cronemberger and Gil-Garcia 2019) and citizen value co-creation (e.g., Owais et al. 2017) in smart cities. However, extant literature on smart city and regional initiatives tends to focus on large cities or densely populated regions, whereas rural regions in developed countries tend to be overlooked (e.g., Markkula and Kune, 2015). The larger the population, the more urgently the need for smart services is considered (Dwivedi et al. 2011). Yet, value co-creation with smart services may be crucial in maintaining rural, sparsely populated regions in developed countries livable by facilitating both individual and community well-being (Newman 1999). Moreover, connections are needed between smart city initiatives and the initiatives of surrounding rural regions, with a focus on higher-scale innovation and sustainability (Kar et al. 2019).

While acknowledging the network of multiple stakeholders is considered essential to the e-government domain (e.g., Axelsson et al. 2013; Balta et al. 2015), previous research has provided little knowledge of public sector value co-creation in rural villages on the service ecosystem level, which involves networks of villages, municipalities, citizens, businesses, and citizen organizations. Co-creation of value by utilizing new technologies in smart cities also remains understudied (Cronemberger and Gil-Garcia 2019). It is well-understood that the most significant challenge in developing smart city services is not technological, but rather attitudinal (Mulder 2014). Thus, to understand how to facilitate ecosystem-level value co-creation in

smart villages, it is essential to understand interconnectedness between actors' practices and institutions as a means to identify the institutional work required for the transformation (Wieland et al. 2016). For instance, institutions such as the norm of having a face-to-face doctor's appointment in a hospital, may need to be disrupted in order to successfully provide digital health care services for rural regions—and this may be done by creating new norms through institutional work, which includes practices such as providing and using digital services.

Methodology

Our objective was to investigate rural residents' preferred practices for value co-creation building on Barley and Tolbert's (1997) guidelines for observing scripts. Scripts illustrate how individual actors construct and commit to new rules and interpretations of appropriate behavior in particular settings. Thus, by employing the uncovered scripts, we are able to determine the institutional work required for value co-creation in the interplay between particular smart service offerings (the micro-level) and the regional service ecosystem of Norrbotten County (the macro-level). We conducted laddering interviews with citizens of nine rural villages or towns in Sweden's Norrbotten County, namely Arvidsjaur, Boden, Gällivare, Haparanda, Jokkmokk, Luleå, Piteå, Överkalix and Övertorneå. Norrbotten was found a suitable research context because, while highly connected, it represents one of the EU's most sparsely populated regions (Regionfakta 2020). The laddering interview technique emulates informants' mental models as personal construct systems, providing means for investigating a system's attributes, the consequences (reasoning) of a system's use, and the values that drive that use (Peffers et al. 2003; Reynolds and Gutman 1988; Tuunanen and Peffers 2018). The goal of the interviews was to map the villagers' views regarding what kinds of public or private digital-enabled services would provide opportunities for value co-creation in the region and why.

We included permanent Norrbotten residents of diverse age groups, occupations and life situations to avoid biases. Fifty-seven informants (60% females) were recruited and interviewed in fifty-three interviews, by students of the Digital Service Development program at Luleå University of Technology. The sample covered professions from administration, architect, inspector, manager, economist, entrepreneur, engineer, municipal councilor, teacher, mechanic, physiotherapist, system developer, caretaker to business developer. Pensioners were also interviewed. The age distribution varied between 24 - 78 years. In one-hour interviews, one researcher posed questions, and the other took laddering notes on a spreadsheet. In accordance with the laddering technique, informants were first introduced to a stimuli collection of six written scenarios (Peffers et al. 2003). For example, one scenario described a potential use case of a service bus that transported equipment and digital-enabled services across the region. The informants selected and ranked two scenarios that appealed to them personally. It was also permissible to add new scenarios ad-hoc, if necessary. The researcher started questioning the informant of the highest ranked scenario, asking "What in this scenario was particularly important for you?" The respondent began describing a particular desired use experience with regard to the selected scenario; this was briefly recorded as attribute ladders. Thereon, the researcher continued asking "*Why* would this be important for you?" (Reynolds and Gutman 1988). The informant continued providing their reasoning to a series of "why" questions; these were recorded as consequence ladders. When no further reasoning could be provided, the ultimate personal goal of the informant was identified; as value ladders. Then, the researcher moved on to asking questions related to the second stimulus, continuing until both stimuli were thoroughly covered. In total, 688 chains (data units) of attributes, consequences, and values were collected, with an average of 13 chains per interview.

Thus, the informants offered their views on future institutional innovations required for the sustainability of villages in Norrbotten, with a particular focus on service portfolios for citizens and livability. The laddering structure of a new service idea by an informant was viewed as a script for encoding institutional principles—i.e., an observable, recurrent set of activities and patterns of interaction characteristic to the smart village setting (adopted from Barley and Tolbert, 1997). Moreover, as several actors identified service-providing public or private organizations within the scripts, another level of analysis emerged at the service ecosystem level. For instance, a localized digital-enabled service point would require rethinking of service models, and collaboration between the public domain as well as private sector actors, e.g., transportation.

The researchers developed codes for the attribute, consequence, and value ladders of the interview chains. The coded dataset totaled 873 data units, derived from the original chains. A clustering analysis was conducted on the coded chains, graphing thematic maps for each emerging digital service theme by connecting "pathways" between attribute-, consequence-, and value-level constructs (Peffers et al. 2003;

Tuunanen and Kuo 2015). In the final analysis, the thematic maps are used for deriving institutional scripts (Barley and Tolbert 1997). The graphical pathways on each thematic map, i.e., emerging scripts, illustrate informants' descriptions of the perceived structures behind co-creation practices enabled by digital service innovations. For instance, one script depicted that access to public services would enable digital booking of services and thus, allow access to health care professionals. This would, in turn, help the informants to get medical advice as more services were digitally available. This, in turn would enable more people continue living and working in villages, while posing the challenge of remotely consulting and identifying health care needs. As results such a script lead to improved public resource and service efficiency and improved health and social inclusion. This all lead to improved comfort and easiness in life. Scripts across all themes will be screened for interplay and overlap. This will enable us to answer our research question and to recognize smart, sustainable joint service offerings, such as digital health services and service points, that will affect institutions throughout the regional service ecosystem formed by the rural villages (Wieland et al. 2016).

Preliminary Findings

The following eight service themes emerged from the interviews: (1) *digital health services,* (2) *service points, (3) digital services for tourism,* (4) *service buses,* (5) *accelerating social life,* (6) *logistics of goods,* (7) *service portals,* and (8) *facilitating citizen transportation*. A unique thematic map was constructed for each theme. Investigating script structures in the thematic maps, we found diversity across attribute-level constructs, but also overlap of the consequence and value constructs across the thematic maps. Table 1 presents exemplars of script constructs from four divergent thematic maps. The exemplars showcase overlap, for instance, with constructs *formalization of organizing and responsibility* and *social inclusion*.

	Attribute constructs	*Consequence constructs*	*Value constructs*
"Digital health services" thematic map	• Access to public services • Booking of services • Coordinated logistics on demand	• Mobility of service points • Organizing logistics • Covers all travel needs • Formalization of organizing and responsibility • No need to travel • Decrease the need of a car	• Public resource and service efficiency • Health • Social inclusion
"Service points" thematic map	• Digital kiosk for communication and delivery • Training/support in digital services • Service point maintenance	• Collaboration among stakeholders • Formalization of organization and responsibility • Need for engagement • Preserving human interaction • Social togetherness	• Prosperity • Self-efficacy • Accessibility • Social inclusion
"Digital services for tourism" thematic map	• Digital service portal and website • Mobile payment for access to activities • Digital kiosk for communication and delivery	• Formalization of organization and responsibility • Collaboration among stakeholders • Welcoming atmosphere • Attracting customers/inhabitants • Business opportunities	• Attractiveness of the village • Awareness • Social inclusion
"Accelerating social life" thematic map	• Social informing and meeting • Coordinating joint activities	• Formalization of organizing and responsibility • Need for engagement • Collaboration among stakeholders	• Public service and resource efficiency • Social inclusion • Prosperity

Table 1. Exemplars of emerging institutional script constructs in divergent digital service thematic maps

We present our preliminary findings from the thematic map "Digital health services" (cf. Figure 1), which was the most frequently discussed theme by the informants. In total, 10 scripts emerged in the thematic map (Table 2). Each script comprehends structures showcasing how particular service features (attribute constructs) may benefit the focal actor (consequence constructs) and co-create value establishing an ultimate goal of service use (value constructs). In the first script, the attribute constructs access to public health services, and access to related educational resources therein, were found important, as they allowed for improved interaction with health services. Thus, the first script indicates that the creation of new institutions would lessen the related frustration, stress, and workload. Consequently, informants claimed that it would aid in enhancing competence, thus leading to the ultimate the values of public resource and service efficiency, accessibility, saved time, comfort and ease of life, health benefits, and social inclusion.

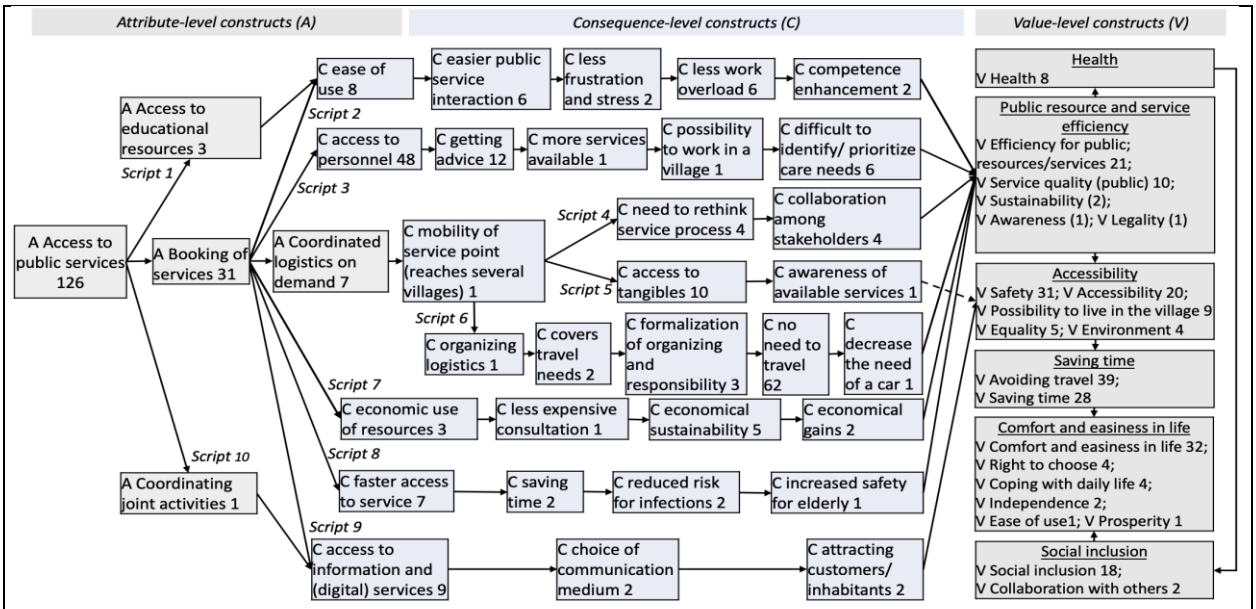

Figure 1. Thematic map, "Digital health services" scripts 1–10: constructs and their frequency (hits)

S	*Attribute constructs*	*Consequence constructs*	*Value constructs*
1	Access to public services → Access to educational resources	→ ease of use → easier public service interaction → less frustration and stress → less work overload → competence enhancement	→ Public resource and service efficiency → Health → Social inclusion → Comfort and easiness in life
2	Access to public services → Booking of services	→ ease of use → easier public service interaction → less frustration and stress → less work overload → competence enhancement	→ Public resource and service efficiency → Health → Social inclusion → Comfort and easiness in life
3	Access to public services → Booking of services	→ access to personnel → getting advice → more services available → possibility to work in a village → difficult to identify/ prioritize care needs	→ Public resource and service efficiency → Health → Social inclusion → Comfort and easiness in life
4	Access to public services → Booking of services → Coordinated logistics on demand	→ mobility of service point (reaches several villages) → need to rethink service process → collaboration among stakeholders	→ Public resource and service efficiency → Health → Social inclusion → Comfort and easiness in life
5	Access to public services → Booking of services → Coordinated logistics on demand	→ mobility of service point (reaches several villages) → access to tangibles → awareness of available services	→ Accessibility → Saving time → Comfort and easiness in life
6	Access to public services → Booking of services → Coordinated logistics on demand	→ mobility of service point (reaches several villages) → organizing logistics → covers travel needs → formalization of organizing and responsibility → no need to travel → decrease the need of a car	→ Public resource and service efficiency → Health → Social inclusion → Comfort and easiness in life
7	Access to public services → Booking of services	→ economic use of resources → less expensive consultation → economical sustainability → economical gains	→ Public resource and service efficiency → Health → Social inclusion → Comfort and easiness in life
8	Access to public services → Booking of services	→ faster access to service → saving time → reduced risk for infections → increased safety for elderly	→ Public resource and service efficiency → Health → Social inclusion → Comfort and easiness in life
9	Access to public services → Booking of services	→ access to information and (digital) services → choice of communication medium → attracting customers/ inhabitants	→ Accessibility → Saving time → Comfort and easiness in life
10	Access to public services → Coordinating joint activities	→ access to information and (digital) services → choice of communication medium → attracting customers/ inhabitants	→ Accessibility → Saving time → Comfort and easiness in life

Table 2. Structures of scripts (S) 1—10 emerging in the "Digital health services" thematic map

The second script was constructed with similar consequence- and value-level constructs as the first; the difference was that the second focused on creating new institutions in the digital booking of health services. The third script had an identical value-level structure as script 2; however, at the consequence level, it

delved into the informative aspects of the access and booking of health services, reasoning that these are important for seeking advice directly from health care personnel and thus have more services available and are better able to work from rural villages. The script showcased that creation of new institutions by remotely consulting health care personnel may trigger a new challenge in which urgent care needs may be recognized too slowly in remote mode. Thus, we identified the need to maintain current institutions, i.e., the option of physical appointments. The fourth script followed a similar pattern in the value-level as script three; however, it focused on the digital booking of physical goods and services, and their logistics in particular. This script suggested disrupting current institutions by showcasing that a digital booking service may provide coordinated logistics on demand, thus stretching available services to several villages through mobile service points. Further, the script four notes that such a service would require innovative health care service processes and collaboration with multiple stakeholders—i.e., the creation of new institutions.

The script five suggested creating a new institution in which citizens gain access to public resources and become aware of available services, leading to accessibility, saved time, and improved comfort and ease in life. Similarly, the scripts nine and ten suggested that the digital booking of health services and coordination of joint activities may provide access to resources such as information and digital services, where citizens may opt to use a preferred communication medium with the service providers, thus attracting more inhabitants and leading to improved accessibility, saved time, and comfort and ease in life. The script six, seven, and eight focused on the digital booking of health services, ultimately leading to the values of public resource and service efficiency, accessibility, saved time, improved comfort and ease in life, health benefits, and social inclusion. The scripts seven and eight suggested the creation of new institutions that would allow more efficient use of public health care resources due to less expensive consultation (in the seventh script) and faster access to such services, thus saving time and lowering infection risks (in the eighth script). In turn, the script six suggested disrupting prevalent institutions as by accessing and booking digital services, on-demand services could be provided on site. This would reduce the need for current types of face-to-face services, as the new practices would be formalized. Moreover, the institution of driving a car to a city to receive health services would also be disrupted in script six.

Discussion and expected contributions

Dissecting the ten emerging scripts from the "Digital health services" thematic map, we bring forth evidence of practices for value co-creation (as structures of attributes, consequences and values) suggested by rural village inhabitants in Norrbotten. Evidently, the values of health, public resource and service efficiency, accessibility, saving time, comfort and easiness in life and social inclusion may be co-created for village inhabitants through the emerging digital health service initiatives. However, such individual initiatives may not be effectively facilitated with the means of traditional market mechanisms in sparsely populated rural areas, such as Norrbotten. For example, a village-based service point providing health-related services may not attract a critical mass of users unless it offered a diverse bundle of other service features as well. Thus, to enhance well-being for the individual inhabitants and also for the public and private service providers and other stakeholders, we suggest there is a need for adopting *institutionalized value co-creation practices* for involving multiple stakeholders in smart service portfolios (cf. Wieland et al. 2016). Exemplar scripts showcased in Table 1 indicate support for this need illustrating how several attribute constructs lead to overlapping consequence and value constructs, showcasing potential synergies in services. For instance, the value of "social inclusion" is contributed by each digital service theme, and two digital service themes point towards creating value from public resource and service efficiency. Here, resultant values are contributed by small streams of several attributes and consequences, concretizing the village-level value as a whole. To facilitate such synergies, smart services ought to connect individual inhabitants with private and public stakeholders at the micro-level, as well as networks of stakeholders at the meso level and municipalities at the macro level. Thus, *we argue for considering the development of smart villages as regional service ecosystems* (Vargo and Lusch, 2016) for several, initially even seemingly unconnected, stakeholders.

To establish a shift toward regional service ecosystems, our preliminary findings indicate that a smart village would require institutional work (creating, maintaining, and disrupting prevalent institutions) and institutionalized practices *at the ecosystem level*. For example, when bringing health services to the village service point, ecosystem-level actions are required for a mutual understanding of appropriate levels of availability of physical or online health services at the service point. This would cover the creation and maintenance of (new) adequate norms and practices of service behavior for both the customers and service

providers. For example, individual customers, and healthcare and service point providers would be included, further connecting with carpooling providers for transporting medicines to customers. Our data indicates ecosystem-level institutional work practices may be derived from scripts emerging from the thematic maps. Further, we propose that such institutionalized service innovation at the ecosystem level would likely require new institutionalized actor roles to orchestrate heterogeneous service portfolios. This may disrupt prevalent institutionalized practices, traditional producer-initiated service models, and assumptions held by service providers and citizens alike. Thus, a "positive disruptor" role may be needed—beyond the roles suggested by Wieland et al. (2016), let alone stakeholder roles in typical e-government projects (e.g., Balta et al. 2015)—to operationalize ecosystem-level service portfolio institutionalization. Establishing and maintaining such an ecosystem-level stakeholder role would require wide acceptance in co-operation of policymakers, public and private service providers, and active citizens, among other actors.

Our remaining work will comprise a detailed analysis of all scripts emerging across the eight divergent thematic maps. Our goal is to investigate synergies between script structures, indicating constellations of smart services promoting overreaching values for the regional service ecosystem. Having conducted the remainder of our analysis, our study will produce a three-fold theoretical contribution. First, we will contribute to the e-government literature by bringing forth novel insights into the development of smart villages as regional service ecosystems viewing institutionalization at a particular service level. Second, we will contribute to the SDL discourse with an empirical study that analyzes institutional work and practices for value co-creation in smart villages through the derived scripts. Finally, to the best of our knowledge, we are among the first to extract scripts from thematic maps constructed from laddering interview chains. Thus, the current study also contributes methodologically to the interdisciplinary discourse on institutionalization. For practitioners, we expect to offer concrete recommendations concerning clearly interrelated stakeholder ensembles for which we can suggest ecosystem-level institutionalization practices. Our implications may further provide opportunities for future action design research initiatives on such practices. While a contextualized study brings forth important contextual insights, it may also pose a limitation for development of theoretical knowledge. As such, our study may not be generalizable to all rural areas in developed countries. Further, we see that we have only scratched the surface investigating institutional work required in transforming rural areas into smart villages. Thus, we call for more studies to investigate value co-creation for regional service ecosystems.

Concluding remarks

Our study concretized the essence of considering smart villages from the viewpoint of regional service ecosystems. Developing smart services for rural villages cannot be based solely on the market mechanisms of single-service offerings. Building a sustainable, many-sided, service portfolio of mutually dependent, digital-enabled service offerings requires institutional work that potentially disrupts public and private-sector institutions. Moreover, co-creation practices are required between actors at the ecosystem level, and such practices ought to be commonly acknowledged among several actors. Currently, ecosystem-level institutionalization practices seem to be missing in establishing public and private services in the context of rural villages in developed countries. This may partially explain the prevailing challenges in developing smart villages, despite the availability of necessary technological solutions and infrastructures. Our analysis scrutinized one potential digital service theme complementing a service portfolio for a regional service ecosystem. We depicted potential institutional work and actors' practices required for institutional change. Further, our preliminary findings showcase synergies between scripts emerging across four divergent digital service themes, indicating that suggested institutional work may facilitate value co-creation if implemented at not only the level of particular services but also at the level of the regional service ecosystem.

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