Service Systems Forum 2015

Service research in the personal data economy

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Conference Proceedings

HAT Hub of All Things   WMG Innovative Solutions   THE UNIVERSITY OF WARWICK

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Preface

The personal data economy, estimated to be worth €1 trillion annually across Europe by 2020, is a major opportunity emerging in the Digital world. The World Economic Forum has urged firms to unlock the economic and social value of personal data in ways that will encourage innovation, gain new insights and make better decisions without diminishing the rights of the individual. The personal data economy consists of individuals, public and private institutions increasingly connected in an ecosystem that shares and uses personal data for commercial and societal benefits through advanced technologies such as wearables and the Internet-of-Things. The service research community is a multidisciplinary academic one from the sciences, humanities and social sciences that has grown over the past 50 years. It is a community that we believe will have much to contribute to the knowledge required in a personal data economy. To further develop this community, the Service Systems Group of WMG, University of Warwick organised the inaugural Service System Forum (SSFV) in May 2015. This forum is now an annual event aimed at providing opportunities for researchers and industrial practitioners to interact, communicate and collaborate to forge a community dedicated to generating real impact on knowledge and practice in the digital economy.

About SSF2015

The 1st Service Systems Forum (SSF2015) was held on May 26-27, 2015 at the beautiful Palazzo Pesaro-Papafava, the University of Warwick's location in Venice, Italy. The event was partly funded by the Hub-of-All-Things (HAT) program and supports its aims. It also featured a Practitioners' Forum, a half-day session with key practitioners to discuss integration of knowledge to inform practice.

With the Personal Data Economy as its key theme, SSF2015 provided exciting platform for the exchange of ideas as it seeks to establish itself as a forum providing opportunities for service researchers and practitioners to discuss and share the latest technologies, methodologies and case studies.

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Maintenance as a Service System in the Context of the Internet-of-Things

By *Sascha Julian Oks*[1] *& Dr. Albrecht Fritzsche*[2]

Purpose

The Internet-of-Things does not only provide sensorial data to improve the management and control of complex operational networks. It also creates new business opportunities on the basis of value streams that have previously not been accessible. These value streams rely on combinations of human action, technical operation and other resources and can therefore best be described as service systems.

Approach

Maintenance activities appear to be a particularly promising field of research in this context. Increased sensorial input about the performance of machines and the environmental conditions under which it takes place allows us to identify new weaknesses, predict failures in advance and optimize procedures for parts exchange and repair. This creates a huge savings potential for manufacturing and other industrial operations, which, however, can only be realized if companies rearrange their maintenance procedures and define new roles for the actors in their value creation processes.

Methodology

Our paper presents a comparative study of four different cases in which companies intend to improve their maintenance procedures using the Internet-of-Things. This includes car production, the operation of wind energy parks, plant engineering and automotive parts supply. We consider maintenance as a service system that involves different actors with different contributions. For each of the four cases, we describe the specific roles and responsibilities of these actors and their interplay with one another in order to highlight the variety of different possibilities to configure the service system.

Findings & Value

Our findings indicate that, despite all differences, there is a general need to revise the conception of the competencies and abilities of the people involved in the system in order to create new value streams. Therefore we advocate a user-centered design approach to service systems design in the context of the Internet-of-Things and draft a suitable procedure for the cases in question.

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Internet of Things-enabled Servitization for SMEs

By *Courtney Thornberry[3]*

Abstract

Both Servitization and the Internet-of-Things are two unique and currently relevant topics in business innovation. Servitization was first recognized in the late 1980s and can be defined as the journey or process a company undergoes to transform from selling just products to selling solutions, or "product-service systems" to their customers. The term the "Internet of Things" (IoT) was first established in 1999 at the Massachusetts Institute of Technology (MIT) and has several defining aspects. In simple terms, it is the ability of objects to connect to the internet, creating a vast infrastructure connecting people to objects, objects to objects and people to people. It can also be described as ubiquitous, embedded or pervasive computing because it has the potential to affect nearly every aspect of human life.

Implementing new technologies and ideas can be a challenge for any organisation, no matter the size. It can require a great deal of expertise, planning and road-mapping to be successful. This challenge can be even more difficult for Small to Medium sized Enterprises (SMEs) due to limited resources of people, time, expertise and money. However, it is this ability to implement new ideas and technologies that allows companies to remain innovative and competitive. Since SMEs accounted for nearly half of all employment and approximately a third of all private sector turnover for the UK in 2014, it is critical to find ways to enable SMEs to be able to successfully innovative as technology evolves. Focusing on both the IoT and Servitization for SMEs is a way to develop innovation for these entities. This work showcases a case study around a London-based technology SME, attempting to implement both IoT technologies and Servitization strategies into their business model. The research will present key learnings and a conceptual framework around developing IoT-enabled Servitization for SMEs.

Purpose/Objectives

The purpose of this research is two-fold; first to show a practical case study of an SME using the Internet of Things to develop new services and second to create a framework, based upon current literature and the case study observations, about the drivers, barriers and characteristics of this process.

Methodology/Approach

The methodology used for the research started with a comprehensive literature review of the three main areas: the Internet of Things, Servitization and Small-to-Medium sized Enterprises. Additionally, a case study approach, utilising some aspects of action research, is ongoing to develop the applied perspective of the work.

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Findings

Initially findings include a framework, developed from a wide range of literature sources. The analysis of the case study data is ongoing and there are no conclusions yet.

Research Implications

The implications of this work is looking at three main areas in a systematic way that could potential provide a basis for the development of tools and process useful for SMEs to utilize new technologies in the IoT to develop innovative and successful services within their businesses.

Originality/Value

While some work has been done looking at the IoT and Servitization, or Servitization and SMEs, very little work has looked as the perspective of using the IoT to create services in an SME environment. This applied work is some of the first in the research area to combine these main topics.

Customer Engagement from Customer-Dominant Logic Perspective

By *Minna Lappi*[4] & *Saara Pekkarinen*[5]

Purpose

Why is it so difficult for us to follow guidelines for healthy lifestyles? Preventive wellbeing services have been designed to encourage us individuals to engage in self-care behaviours to improve our wellbeing. When willing to engage in managing our personal wellbeing we contribute to our value creation processes (Zainuddin et al., 2013). The purpose of this research is to explore how value formation emerges from an individual's perspective within the context of preventive wellbeing services, and how using and sharing personal data related to these services influences the value formation process. In addition this research aims to understand how engagement should be defined and how it appears to individuals. Thus, this research also aims to capture different dimensions of the phenomenon of customer engagement.

Design/Approach

Qualitative research methods will be adopted in this study, since the aim is to increase our understanding by studying previously under-investigated phenomenon that is complex in nature (Yin, 2003). A case study is an appropriate research strategy for studying change processes related to service business (Grönroos, 2006). Recently, marketing research has been focusing on value creation from service and interaction approaches of S-D logic (e.g. Vargo and Lusch, 2004, 2008, 2014). In the case of preventive wellbeing services, though, a broader view to individuals' lives will be needed. Heinonen et al. (2010) introduce a new perspective to the roles of customers and companies in creating value emphasizing a holistic view to individuals' lives, practices and experiences, in which services become embedded in a natural way. Customer- dominant logic (Heinonen et al., 2013) places the interest in individuals' contexts as whole and not in companies' processes or services as such. This new perspective to the roles of individuals, companies and services also means redefining the concept of customer engagement, since individuals' engagement is no longer relevant only to services but more intensively how services are capable to support individuals' lives (Heinonen et al., 2010). A customer-dominant logic perspective (Heinonen et al., 2010) will be adopted in this research to investigate how service user engagement and using personal data will link to value formation.

Findings

This study suggests a model for value formation from an individual's perspective in a case

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where personal data is used and shared within an individual's ecosystem. In addition this study redefines the concept of customer engagement in the context of preventive wellbeing services. Even though customer engagement in creating customer experience and value has been receiving attention in marketing research, the definition of customer engagement has been limited (Vivek et al., 2012). In this study engagement will have two aspects related to value formation. Firstly, individual engagement meaning how individuals become engaged in healthy life styles, and secondly, customer engagement viewing individuals' involvement with preventive wellbeing services. When providing these services either face-to face with service users or online through the Internet, companies become involved with individuals' dynamic and complex ecosystems. Through sharing customer data, companies can provide customers additional support to their value creating processes (Saarijärvi et el., 2014) and motivate customers to become involved in services and so aim to higher level of customers' perceived service value (Cheung and To, 2015). Even though companies have invested a significant amount of resources in customer relationships management systems (CRM), actually using customer data in their businesses has been largely ignored (Saarijärvi et al., 2014). Adopting the perspective of customer-dominant logic encourages companies to get involved with individuals' broader life setting.

Originality/value
This study contributes to the discussion of service-dominant logic and customer-dominant logic within marketing research in two ways. First, the study reveals a fresh view to the roles of individuals, companies and services in a value formation process in wellbeing services. Second, the study offers an approach of engaging individuals in in value formation processes through using and sharing personal data between individuals and companies on behalf of individuals themselves.

Keywords
 Value formation, Personal data, Preventive wellbeing services, S-D logic, Service ecosystem

Personal Perceiving Behaviour Data in Food Culture Heritage

By *Urapree Prapasawasdi[6], Lunchakorn Wuttisittikulkij[2],*
Laphasrada Changkaew[3], Chaleeda Borompichaichartkul[4]

Introduction

Nowadays, internet usage has dramatically increased and database sources have continuously grown (Aldebert et al., 2011), as more people use the internet to search for information i.e. on the food industry, culture and others. Researchers study the concept of culture via the information system (Emery & Trist, 1960; Mumford, 1979), and find that information bases such as mass media and guide centres are significant sources of destination choice decisions (Beerli & Martin, 2004). In addition, web services are becoming a principled way for any person to obtain, disseminate, broadcast and share information.

Food is a heritage resource and can be promoted to local communities (Bessiere, 2013). Presently, society often uses culture (Yiannas, 2009) and food has come to be recognised as part of local culture (Giampiccoli & Kalis, 2012). The relationship between IT and culture helps us to understand the complexities of personal social identity (Gallivan & Srite, 2005). Therefore, studying personal data with regards to food preference is important in many aspects. Personal data indicates each person's behaviour in selecting from among many choices. This can affect customer decision-making, which is an essential factor for web services (Sun Z., et al., 2012).

Objectives

The objectives of this research are to investigate the relationship among factors such as attitude, subject norm, expectation, perceived value and demographics, and to examine the use of internet searches for information.

Methodology/Approach

The theory of planned behaviour is used for predicting behaviour. The technology acceptance model is also used for checking web services to understand how users come to accept and use the technology. This study involved in-depth interviews of four sample groups; local mentors, food specialists, local food sellers and consumers in Chiangmai, Thailand.

Findings/Results

The results of this study show that culture and local food are deeply related to each other, i.e. local food shows the easy way of life. Attitude and subject norm are linked in people's

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way of life. All groups maintain that local food is important and reflects their culture; moreover, information about local food needs to be distributed to people via media. Expectations and perceived value are involved in the material, method and process of local food, i.e. such as the way the food is consumed. Most elders have experience with local food while the younger generation is still learning to perceive local food knowledge. The strength of Northern Thailand's local food is in its taste, while food specialists also view that such local food has value in terms of its usefulness and unique ingredients. Most people perceive information about traditional food via websites related to internet users trend which dramatically grow (National Statistical Office, Thailand 2014), from other media such as TV, advertisements and especially by storytelling.

Local mentors grow their own vegetables that are consumed by their communities, with the remainder sold to local food sellers. Local mentors also transfer recipes, cooking methods and stories to local sellers to add more value to the vegetables sold, and they are the best storytellers of local food knowledge, as they have tacit knowledge and can link between local food and culture. Local food sellers can receive tacit knowledge from both local mentors and food specialists and apply this to explicit knowledge. Food specialists can support local mentors in the management and sharing of such knowledge, as well help transfer the knowledge to local sellers and consumers by mass media such as television, internet, and radio. Hence, consumers perceive local food knowledge from local mentors, food specialists and local food sellers.

The study also found that the best way to link between local food knowledge and culture to interested persons such as consumers and tourists, is through the use of a knowledge base or database centre which is the main media to connect tacit knowledge and explicit knowledge.

Future Research
Further research can be quantitative in terms of studying what people are searching for, as well as looking into New Product Development to design the database system and website to fulfil the consumers' needs.

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Personal Money

By Phil J Godsiff[7]

Purpose/objectives

This paper explores the need for traditional "money" in exchange, especially under the conditions predicated by Service-Dominant Logic (SDL). There is a growing awareness, of the possibility that digital reputation, personal data and access to analog possessions, could be used as "currency" to transfer and store value, for example through prosumption, sharing and rental. In a digital world of enhanced information availability, networks and economies of use, not scale, become significant. Analog markets and systems will experience disruption, deregulation, dis-intermediation and re-intermediation (as has already been demonstrated by, for example, BlaBlaCar, Airbnb and Uber). The established "cash nexus"[8] may reduce in significance. In the past, personal or corporate reputations have often been the basis for underwriting actual or potential financial transactions. This was the basis for bills of exchange, letters of credit, bank managers underwriting a customer's credit application, and it remains the basis for *hawala*[9]. It is possible that social reputation, in the form of social graphs, could again be used as currency. This paper initiates an exploratory dialogue as to the implications of such developments.

Methodology/Approach

The methodology involved a brief systematic review of literature involving particularly those SDL narratives where money is explicitly included in the analysis, and development of other previous research on crypto-currencies and the nature and origins and futures of money.

Findings

A key tenet of SDL is that *"Service is exchanged for service"[10];* and that "..*service is provided through complex combinations of goods, money and institutions..."* which form the market place for transactions.   There is evidence for the centrality of traditional money within SDL, as evidenced by, interalia: such views as *"price (an expression of value in exchange) was a quantitative estimate of how valued a party's specialized-resource-based service potential was in a market-based economy;"* and   *"SDL is grounded in micro activities of humans ..offers justifications for ..macro institutions and structures…goods money organisations intermediaries and markets …as natural consequences of specialisation and exchange"* and *"The market place uses money a medium of exchange"*

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[8]The relationship constituted by monetary transactions". (Oxford Dictionaries Online)

[9] Hawala is a method of transferring money without any actual movement. One definition from Interpol is that Hawala is "money transfer without money movement." Transactions between Hawala brokers are done without promissory notes because the system is heavily based on trust." (*www.investopedia.com/terms/h/hawala.as*)

[10] A key principle underlying service-dominant logic

Recent developments in SDL analysis have widened the "marketplace" to include transactional markets, social markets, and public (government) markets employing potentially separable economic, social and public currencies.

Digitalisation and digital disruption may have contributed to a potential subversion of the role of money. Digital connectivity has brought about fundamental shifts in user convenience and the way communities are formed. Crypto-currencies such as Bitcoin, employing a distributed consensual ledger technology dispense with both intermediaries, and the necessity for tiered hierarchical systems. (Currently customers use banks, who themselves bank with the central bank, which itself is underwritten by the relevant national government)

The traditional economist's view, that money was invented as a result of increasing specialisation and a means of reducing the transaction costs of barter, and that markets arose consequently, (explicitly supported as a conceptual tool within SDL), is challenged by other disciplines. Anthropologists suggest for example that money (and markets) were a government invention to facilitate tax collection and military expenses as earlier systems of personal obligation were superseded.

The invention of community based crypto-currencies, which acquire exchange value and time value is evidence that money is not necessarily restricted to government based fiat types. If as is often claimed, money is just a technology used within a community, or a "reputational group", it is possible that service, in addition to being the basis of exchange, could in addition become the measure of exchange, in the same way that money is its own unit of account. Such a currency would also have value in use. "Facebook", not the market could become "*the central forum for exchange*".

Research Implications
These developments in currency and connectivity lead to a number of multi-disciplinary research challenges, including: What would personal currencies look like and how would they behave? Does the market economy need money? How do we transact and how do we ensure security and privacy? What is the appropriate role of government or any other underwriter in market regulation? Could "service" become a unit of exchange and a measure, rather than money?

Originality/value
This conceptual paper questions the assumptions about money contained explicitly and implicitly in SDL. It stimulates discussion around the need for a further proposition within SDL specifically dealing with the medium of exchange.

There is No Such Thing as a 'Free' App: What Do We Give in Exchange for Free Services in the Digital Economy?

By David Reynolds[11]

Purpose/Objectives
One of the key challenges facing firms in the Digital Economy is *monetization* (i.e. strategies for making money while simultaneously providing their core services to users for free). Firms such as Google and Facebook have shown one successful monetization strategy is through the use of advertising. However there is increasing concern regarding the largely involuntary sharing of personal data, which is the main enabler of most advertising models.

If the fundamental purpose of a firm is to seek superior financial performance from its activities then at some point, a firm must receive financial *consideration* in exchange for its product/service. If the consideration is not initially financial (e.g. personal data), it can be argued that there must exist a process by which the non-financial consideration is *commodified* (i.e. transformed into money).

This process of monetization is investigated from the perspective of users of free services in order to determine what, if anything is given in exchange for 'free' services and how this non-financial consideration may be used by firms to generate money.

Methodology/Approach
An abductive approach was adopted (systematic combing) using interviews, websites, and end-user licence agreements in order to build both a theoretical framework and to examine what forms of non-financial consideration are exchanged in the digital economy.

Findings
This paper proposes that the *commodification of non-financial consideration* occurs as part of a service ecosystem which links two (or more) service systems through their respective exchange relationships. And identifies 4 potential types of commodification of non-financial consideration process: intermediary, freemium, platform, and prospective.

Multiple types of non-financial consideration were also identified: personal data, metadata, activity data, digital labour/content, rights, and emotions.

Research Implications/Value
The commodification of non-financial consideration framework and proposed system/consideration types form a foundation for further investigation into the nature and role of the firm, exchange and resources within the dynamic, fast paced context of the digital economy.

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Health Services as Collective Activity: An Ontological Engineering Method

By Susan Wakenshaw[12]

Purpose

By using an ontological engineering method, we develop a method which could potentially enhance the process of matching expertise and patient's medical needs and enhancing collective activity in the medical community to jointly achieving the goals of the patients.

Theoretical Background

The method developed in the paper is based on a model of collective activity (the activity system model (Engestrim's model) and social network theory. Drawing on competence of members and collaborating among the members' within the medical community are significant for meeting patients' medical needs. However, a lot of work has to be completed manually. In this paper, we developed a method which could achieve the automatic matching of the patients' needs and medical expertise of doctors or hospitals.

Contribution

Theoretically, this paper contributes to health information technology. Practically, this method enhanced the health services through matching, collaboration, interaction at the community level. Our pilot experiment in the field was for the largest medical tourism agent in the UK at the time – the Taj Medical Group, on an automated healthcare service-matching platform. The ontology based matching mechanism significantly improved the matching result, and subsequently made a previously labour-intensive process driven unfeasible commercial proposition into a semi-automated computer driven process that is commercially viable.

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Service-Dominant Logic as a Lens to Understand Appeal and Acceptance of Medicine: Cross-case Comparison of Medicine Appeal and Acceptance in India, Uganda and Nigeria

By Peter Ward[13]

Purpose

Medicine adherence levels remain frustratingly static at around 50% in the developed world and are likely to be lower in the developing world (Sabaté, 2003). Sabaté goes on to say that improving adherence would have more effect on health than any improvement in specific medical treatments (ibid.). The study of adherence improvement has historically focused on increasing motivation through behaviour change (Kreps et al., 2011). However, there is some awareness – though little research – that other factors are important, including medicine appeal (Davis, 2007) and acceptance (Murray et al., 2009; Shapiro et al., 1986). Together, appeal and acceptance determine whether medicine is acquired and consumed, hence whether patients are adherent and so can derive value from it.

Approach

We use Service-Dominant Logic (SDL) (Vargo & Lusch, 2004; Vargo & Lusch, 2008) as a lens to investigate consumption as being the "last yard" of the supply chain, and empirical research performed in India, Uganda and Nigeria to assess how different populations view the formulation and packaging of Oral Rehydration Salts (ORS) and Zinc. Over 700,000 children die from dehydration each year due to diarrhoea, of which more than half are in Africa (Walker et al., 2013). ORS taken with Zinc is the treatment recommended by the World Health Organisation. However, demand is weak in many parts of the developing world, where caregivers instead often incorrectly use local remedies, antibiotics or loperamides (for example, Imodium).

Findings

The research investigated whether different packaging designs would affect the appeal and acceptance of the medicine to caregivers, its correct preparation and dosing, and the use of ORS and Zinc together. The results of the surveys provide empirical evidence of both common and differing preferences across the three focus countries. Across all three countries, the three packs were significantly preferred over existing designs on the market, and all achieved high ratings. The smaller sachet formulation was popular in all three countries. Respondent comments indicated that this was due to it reducing wastage and therefore being more economical. A consistent message from the interviews was dislike of the taste of the ORS. Additional concerns about the taste of ORS incorporating water purifier were also common in all countries.

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Research Implications

Our theoretical analysis of the three case studies using the lens of SDL provides potential explanations for medicine appeal and acceptance based on cultural and environmental factors. Once the target context is understood in sufficient detail, a product's value proposition can be designed or refined so that its affordances achieve greatest appeal and acceptance in that context. The results of the research provide practical guidance for supply chains on how to enhance the initiation and implementation phases of adherence by provoking purchase and encouraging persistence.

Originality

We have found a common set of factors with specific country differences which could permit the extension of the findings to supply chains for other medicines and potentially for other products.

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Towards a Research Framework for Personal Data Transparency

By *Dirk Stelzer*[14]

Introduction

Personal data transparency (PDT) denotes the ability of individuals to easily notice and understand acquisition, use and dissemination of their personal data by service providers, government agencies or third parties. PDT is a prerequisite for information privacy, i.e., the ability to control the terms under which personal information is acquired and used. Information privacy is a precondition for a fair personal data economy and for nondiscriminatory personal data markets, particularly. Interest in PDT is rising. However, a clear understanding of how PDT can be conceptualized, implemented and evaluated has not yet emerged.

Objectives

The presentation suggests a framework for conceptualizing key elements of PDT.

Method

The framework is based on findings of a literature review of publications on data transparency, information privacy, and the personal data economy.

Results

The framework includes the following dimensions: stakeholders, data subjects, data holders, types of data, acitvities of the personal data value chain, levels of data subjects' autonomy, and transparency enhancing technologies. Each dimension is described by several characteristics.

The objective of the framework is to provide a foundation for future research into PDT. The framework should also stimulate scholarly discussion and encourage future efforts in service research in the personal data economy. It helps to integrate findings from information privacy and personal data economics into service research in the personal data economy. It may also help to augment consumers' awareness and understanding of PDT and provide a basis for better informed decisions about evaluating, providing, and trading personal data.

Companies might use the framework to better understand what levels of PDT are essential for their business, as a structure for implementing PDT and as a reference for benchmarking their PDT activities. The framework will also be helpful for consumer protection associations and legislators in their efforts to improve PDT.

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