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Abstract

In recent years, service-oriented thinking and customer orientation have gained interest in both research and practice instead of and in addition to the traditional product- or goods-oriented thinking. Organizations developing new business models and their service offerings that combine services to tangible products will probably succeed. The service offering of a company can be modular, i.e. consist of standardized base services, customized services, and their combinations. The study adds on the previous literature on the modularity of service encounter processes. First, it demonstrates how the applicability of service process reuse and variation can be studied in an organizational setting from the customer perspective. Second, the impact of modularization on the likelihood of trial and perceived utility of expert and novice customers are examined. Finally, the service process modularization model developed by Tuunanen and Cassab (2011) is validated in a real-life context.

Keywords: service process, service extensions, modularization, design, and innovation.

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Service Process Modularization: The Question of Customers' Utility

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Abstract: In recent years, service-oriented thinking and customer orientation have gained interest in both research and practice instead of and in addition to the traditional product- or goods-oriented thinking. Organizations developing new business models and their service offerings that combine services to tangible products will probably succeed. The service offering of a company can be modular, i.e. consist of standardized base services, customized services, and their combinations. The study adds on the previous literature on the modularity of service encounter processes. First, it demonstrates how the applicability of service process reuse and variation can be studied in an organizational setting from the customer perspective. Second, the impact of modularization on the likelihood of trial and perceived utility of expert and novice customers are examined. Finally, the service process modularization model developed by Tuunanen and Cassab (2011) is validated in a real-life context.

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INTRODUCTION

In the highly competitive markets of the new service economy, business processes, practices, and operations of an organization continuously have to meet the needs of the marketplace. In recent years, *service-oriented thinking and customer orientation* have gained interest in both research and practice instead of and in addition to the traditional product- or goods-oriented thinking. Service oriented research has been conducted in various fields of research such as marketing, operations management, supply chain management, and information systems science. Even a new discipline Service Science or Service Science, Management, and Engineering (SSME) has emerged (Maglio et al., 2006).

Organizations developing new *business models* and their *service offerings* that combine services to tangible products will probably succeed. The service offering of a company can be modular, i.e. consist of standardized base services, customized services, and their combinations. Commonly mentioned benefits of this kind of *modularization* include larger product variety, improved flexibility, simplification of complex systems, and cost savings (Jose and Tollenaere, 2005; van Liere et al., 2004). In operations management, modularity is regarded as the key prerequisite to mass customization (see e.g. Bask et al., 2010). Software engineering researchers, in turn, maintain that reuse and variation of software code enables more efficient development of new versions of the software artifact (Rothenberger, 2003; van Ommering, 2005). The application of modularity has been acknowledged as potentially beneficial also in the service context (Bask et al., 2010; Tuunanen and Cassab, 2011).

Furthermore, Tuunanen and Cassab (2011) have argued that service process modularization enables the firm to generate market impact efficiently through innovative offerings and service extensions characterized by reuse and variation of existing service processes.

The study adds on the previous literature on the modularity of service encounter processes. First, it demonstrates how service process reuse and variation can be studied in an organizational setting. More specifically, the applicability of modular service encounter processes from the customer perspective is scrutinized. Second, the impact of modularization on the likelihood of trial and perceived utility of expert and novice customers are examined. Finally, the service process modularization model developed by Tuunanen and Cassab (2011) is validated in a real-life context.

BACKGROUND: SERVICE PROCESS MODULARIZATION

Service process modularization is a service innovation strategy used to enhance the organization's portfolio of offerings. Tuunanen and Cassab (2011) define service process modularization as "*the systematic combination of service encounter processes known to both the customer and the firm that generates new, customizable service packages of increased utility to the customer*". A module (component) performs a certain operation or function and has a standardized interface for integration. In *modular reuse* (Baldwin and Clark, 2000), the modules that make up a service or product are reused with no or minor revisions in the design of another service or product, i.e. in different context. By reusing service process modules organizations can reduce cost and timing of new offerings (Ettlie and Kubarek, 2008). In *modular variation*, a major revision is made to the module in a service or product before it can be used in a different context. Hence, when applying modular reuse, a new service extension is developed reusing a part of the base service, whereas through variation, a new service is developed where a modified base service process is included.

The degree of customer involvement and customer's role in the service process depends on the process (Wemmerlöv, 1990). Tuunanen and Cassab (2011) have examined the effect of service encounter process similarity on perceptions of utility and likelihood of trial, in offerings that combine base services of high versus low task complexity and service extensions characterized by reuse versus variation of the base service processes. Thus, a rigid *service process* can be characterized by low level of task variety, low level of technical skills required, low level of information exchange between the service system and the customer in order to create the service, and a process narrowly defined so that the service co-creators, i.e. employee, information system or the customer, make few judgmental decisions. A fluid service process is, in turn, characterized by high level of task variety, high level of technical skills required, high level of information exchange between the service system and the customer in order to create the service, and a process broadly defined so that the service worker (or the customer) often goes through unprogrammed activities and makes several judgmental decisions (Wemmerlöv, 1990).

Tuunanen and Cassab (2011) have found strong support for service process modularization by using reuse and variation concepts. The findings show that when the base service is

characterized by low task complexity, the customers find the likelihood of trial and perceived utility of the combined service offering (base service + extension) greater when a service extension is based on modular reuse, as compared to a service extension through modular variation. Furthermore, for a high task complexity service offering, modular reuse of the service process was found to support greater likelihood of trial than variation-based process modularization. Similarly, for a low task complexity service offering, modular variation of the service process had a greater likelihood of trial than modular reuse of the service process. Therefore, we can conclude that likelihood of trial follows the original argument of how task complexity impacts customers' behavior and decision-making.

However, the findings were not as straightforward for the perceived utility for the combined service offerings (base service + extension). Tuunanen and Cassab (2011) did find empirical evidence that for a service of high task complexity, a combined offering of the base service with modular reuse has greater utility than a combined offering with modular variation of the service process. For service offerings with low task complexity, the hypothesis was that a combined offering of the base service with modular variation has greater utility than a combined offering with modular reuse of the service process. This was not supported by the empirical studies. In the latter experiment the results were reversed, which was a confusing.

RESEARCH-IN-PROGRESS

Our field study organization is a logistics service provider (LSP) for consumers and organizations in Finland. We focus on the service encounter process or customer interface of these services. There are two points of customer service encounters in the postal system: sending and receiving a letter or a parcel, i.e. in the beginning and in the end of the postal service process. The company operates in Northern and central Europe and in Russia. The turnover was EUR 1.8 billion and the number of employees was around 29,000 in 2010. The share of international business is one third, and business-to-business customers account for approximately 96 % of the sales.

Key customer industries include media, trade, and services. The group operates in three business sectors. Mail Communication unit provides letter, direct mail, and publications (e.g. magazine and newspaper) delivery services as well as customer relationship (CRM) solutions for organizations. Information unit offers information logistics solutions to corporate customers for outsourcing invoicing, financial management, and digitization (sending, receipt, processing, converting, storing, archiving, channeling, and transmitting information in printed and electronic forms). Logistics unit provides material logistics services (parcels, freight forwarding, transport and delivery, and warehousing) and comprehensive contract logistics solutions that can be integrated to the customer's information systems. In addition to the physical mailbox, an electronic letter transaction service is offered to consumers.

As the focal point of our study, we have chosen the letter mailing service. The base service process therefore in this case is the traditional paper letter delivery process. The reuse of the service process is a paper letter sent by LSP on behalf of the business customer. A typical

example of this is the telecom operators' monthly invoices to their post-paid customers. A business customer, i.e. the telecom operator, sends the invoice material to LSP in a digital format that, in turn, prints and mails the letters to the operator's customers. A variation of the service process is the "electronic letter transaction" service, which is currently piloted in one rural town in Finland. With this service LSP scans, with the permission of the end-customer, all mail that the customer receives and emails the scanned material daily to the customer. The customers receive all their physical mail once a week. The value proposition for the end-customer is that they receive their mail faster and more conveniently. For LSP, the reduced delivery costs are the key driver for the service introduction.

In this study, we seek to validate the service process modularization model on customer response to modular reuse and modular variation of service encounter processes in new offerings in one organization. Previously reported experiments (Tuunanen and Cassab, 2011) showed that service process modularization increases both the perceived utility of an enhanced offering and the likelihood of trial for service extensions. The effect of modular reuse versus variation is contingent on the task complexity of the base service. Furthermore, expert customers prefer combined offerings that reuse familiar service processes suggesting that practical considerations rather than variety are the main drivers of service utility and likelihood of trial. Hence, we will also further investigate how task complexity affects both perceived and realized utility of combined service offerings.

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