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Abstract

The purpose of this paper is to advance our understanding of what contextual factors influence the service bundling process in an organizational setting. Although previous literature contains insights into the mechanisms underlying bundling and the artefacts for performing the bundling task itself, the body of knowledge seems to lack a comprehensive framework for analysing the actual scenario in which the bundling process is performed. This is required as the scenario will influence the bundling method and the IT support. We address this need by designing a morphological box for analysing bundling scenarios in different organizational settings. The factors featured in the box are systematised into a set of four categories of bundling layers which we identify from reviewing literature. The two core layers in the framework are the service bundling on a type level and on an instance level (i.e. configuration). To demonstrate the applicability and utility of the proposed morphological box, we apply it to assess the underlying differences and commonalities of two different bundling scenarios from the B2B and G2C sectors which stress the differences between bundling on a type and instance level. In addition, we identify several prospects for future research that can benefit from the proposed morphological box.

Keywords

Service Bundling; Service Science Management and Engineering; Customer Interaction; Configuration; Morphological Box; Co-Creation

INTRODUCTION

With the increasing role of services in the economy and organizations, service offerings gain more and more prominence. According to Grönroos (2007) a good enough core solution (a physical product, a service, or a combination of goods and services) is necessary to compete in the marketplace, but is not sufficient for a competitive advantage. This requires an enhanced offering consisting of physical product components, service components, information, personal attention and other elements of customer relationships. Grönroos labels it a *service offering*, even when the core solution is based on a physical product, because all elements of the offering are combined to provide a value-generating service for customers.

Bundling services with other services or with products provides a way to create new service offerings or to enhance exiting service offerings. Generally, a bundle represents a package that contains at least two elements and presents some kind of value-add to potential consumers. The benefits of bundling for business have long been recognised in literature, for example the opportunity to increase competitive advantages for an organisation over rivals in the market (Lawless 1991) or to create entry barriers for potential market penetrators (Nalebuff 2004). The advances in information and communication technology, in particular the internet has made service bundling even more prominent. More and more (new) services become electronically available and there are new opportunities to bundle services, for example, via one-stop portals (Wimmer and Tambouris 2002). Moreover, this opportunity is not only recognized by the private companies, also government is looking more and more for new ways of service its citizens in a more effective and efficient way (Ho 2002).

While a considerable amount of literature addressing the process of service design or new service development can be found today (e.g. Froehle and Roth 2007; Menor et al. 2002), much less is known about approaches that facilitate the creation of adequate service bundles. Despite the fact that companies across all industry sectors with increased market pressures are challenged by the issue of service bundling (Akkermans et al. 2004), only little guidance has been provided so far for the identification of potential bundle candidates and for the actual process of bundling, whereas much has been written about strategic objectives and pricing strategies for bundling decisions.

In this paper, we aim to address this gap. In order to systematise and select approaches for service bundling, a common understanding is needed about the influencing factors of the scenario, into which the process of service bundling is embedded. In other words, our leading research question can be stated as: *What are the contextual factors that influence the act of service bundling?* The theoretical contribution of the paper is twofold. First, we differentiate bundling scenarios conceptually by presenting a layered model of the service bundling task. Second, we offer a morphological box that contains a set of contextual factors relevant for describing any given service bundling scenario. This morphological box can guide analysts and designers of bundling scenarios in setting up a field description (Alexander 1970) of the environment in which the bundling task takes place. This field description can inform the selection of the bundling method for the bundling task guide the design processes of IT artefacts (Hevner et al. 2004; Peffers et al. 2008) to perform or support the bundling task.

The remainder of the paper proceeds as follows. First, we systematize previous work on service bundling and product bundling into a 4-layered framework (Section 2). Second, informed by the 4-layered framework we set up a morphological box for analysing bundling scenarios with a predefined set of contextual factors (Section 3). The morphological box can assist researchers and practitioners with identifying the contextual factors encountered in a bundling scenario. This is also a prerequisite for developing or selecting adequate IT artefacts to support the bundling process, since IT artefacts need to be successfully embedded into their environment. We demonstrate the applicability and utility of the morphological box by analysing two application scenarios of bundling in a government as well as in an industry setting (Section 4). As can be inferred from this analysis, the bundling task greatly differs in both application scenarios and so will the IT artefacts that are meant to support the bundling processes respectively (Section 5). We conclude by identifying some prospects for further research (Section 6).

THE 4-LAYER MODEL OF SERVICE BUNDLING

We integrate various insights presented in the current body of knowledge on bundling into a framework, to which we refer as the 4-layer model of bundling (Figure 1). It is structured globally into parts associated organizationally with the service provider, as well as parts associated with the service customer. This is in line with service being conceptualized as an activity based on a co-production between service providers and service customers which is the most constitutive element for the creation of service (Edvardsson et al. 2005; Vargo and Lusch 2004; Vargo et al. 2008).

The layers conceptualized in the framework are described below, which are also complemented by a running example from the B2C domain:

Atomic service portfolio on a type level (Layer 1): Service providers, no matter whether they are manufacturing companies or service companies, offer value propositions to their clients (Vargo and Lusch 2004). In order to do so, companies strive to engineer a portfolio of goods and services that can together provide for the service a customer requires. On layer 1, every service that provides an identifiable offering that is (or might be) of value to customers is defined on an atomic level of detail. These services are defined on a type level (Becker et al. 2009) since they are engineered as abstract value propositions without reference to any particular customer. Consider, for instance, the service *Check Brakes* as systematized on this layer. This service can be provided by a car repair shop to any customer willing to buy this service. To increase its efficiency, the car repair shop might apply techniques for service engineering (Ganz 2006) in order to streamline the service's efficiency by designing the service tasks, the service business process, the resources consumed in the service process, and so forth.

Service bundles on a type level (Layer 2): Service providers might want to bundle their goods and services on a type level without reference to any particular customer, in order to maximize their profits or create a competitive edge. In that way, service bundles are put into a service catalogue, containing all services that the service provider offers in the marketplace. Since not all service offered in this service catalogue need to be bundled from atomic services, the service catalogue can also contain unbundled atomic services. This corresponds to a *mixed-bundling* strategy (Guiltinan 1987), whereas offering services solely in bundles would be a *pure bundling* strategy (Guiltinan 1987). Many advantages to be realized from bundling services on a type level have been identified in the literature, for example the opportunity to increase competitive advantages for an organisation

over rivals in the market (Lawless 1991) or to create entry barriers for potential market penetrators (Nalebuff 2004). In the example, the car repair shop might decide to offer the service *Check Brakes* only together with other services (such as *Check Engine* and *Refill Oil*) as a *Car Inspection* service bundle. Consistently, only the bundle will be contained in the service catalogue.

Service bundles on an instance level (Layer 3): On an instance level (one might also say: at *run time*), services are bundled in order to fulfil a demand of a particular customer. At this point the service bundle is, therefore, no longer abstract. This process is sometimes called *configuration*. This is the stage where the demand of a customer is linked with goods and services offerings that might then create value-in-use for a customer. Since the service now is associated with a particular customer, who needs to supply inputs into the service process (Becker et al. 2009), this layer also encapsulates the activities of value co-creation that are constitutive for any service. The configuration process itself can be supported by IT, based on defining sets on configuration rules that define and at the same time constrain the overall solution space that can be offered (Becker et al. 2009). In the car maintenance example, bundling on an instance level could mean that a customer brings his/her car to the car repair shop for maintenance. At the reception desk, the mechanic identifies the goods and services needed to check and repair the car and thereby bundles them together into a coherent value proposition for the customer.

Customer's needs, wants, and demands hierarchy (Layer 4): "A service is performed by an entity for the benefit of another entity or the entity itself" (Maglio et al. 2009). The motivation to use a service has, therefore, been found to be rooted in a problem that the customer wants to have solved. Baida (2006) conceptualized a three-tiered hierarchy to reason about this phenomenon, by differentiating customer's needs, wants, and demands (Baida 2006). A need is "a state of felt deprivation of some basic satisfaction" (Kotler 1988). Needs are usually abstract and difficult to grasp (Baida 2006) and might therefore have to be identified in a systematic process. A want is a desire for specific satisfiers of deeper needs (Kotler 1988). This means that a need (although possibly subconscious) becomes manifest in wants for something. An example might be the need for "mental advancement and self esteem" that manifests as a want for "education". On an even more detailed level, wants become manifest as demands. A demand is a want for specific products (i.e., physical goods or services) that are backed up by an ability and willingness to buy them (Kotler 1988). Therefore, a demand is a concrete intention of a customer to buy something that he perceives to be "on sale". Other authors (Becker et al. 2009) have outlined that the connection between customers and service offerings are based on "customer preferences" which is in essence corresponds to the want as proposed by Baida (2006). In the car repair example, the customer might feel the need for transportation which is translated into the want of having a functioning car at his disposal. Since the want is not in line with reality (the car is damaged), he develops a demand for a car repair service. As soon as this demand is satisfied with the services and goods offered by the car repair shop in exchange for money (value-in-exchange), the customer can use his car again to satisfy his needs (value-in-use) (Vargo et al. 2008).

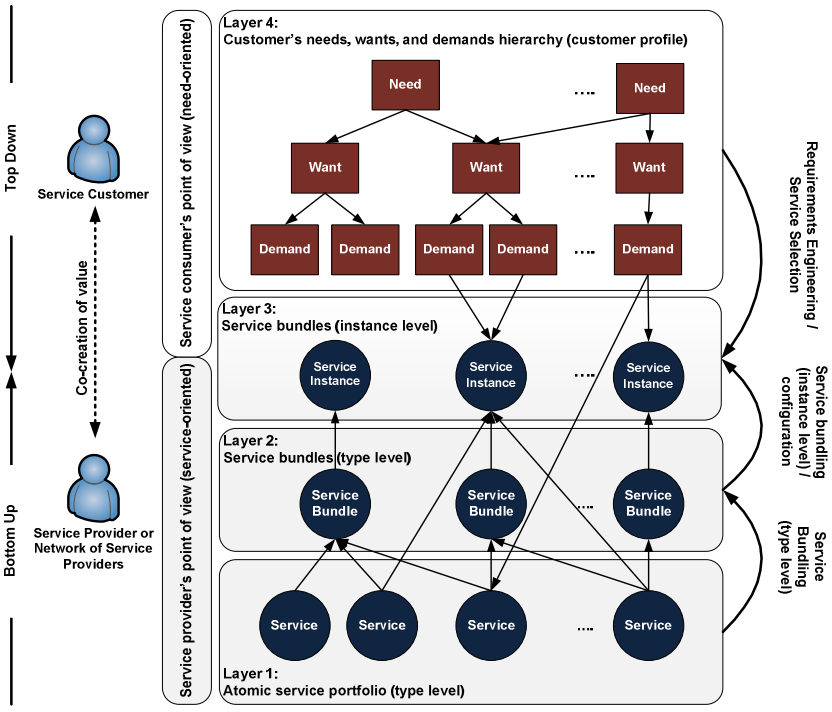

Figure 1: The 4-layer model of service bundling

THE MORPHOLOGY OF BUNDLING SETTINGS

From the insights presented earlier, we design a morphological box that can be used to analyse the environment in which the service bundling task is performed. Morphology is the science of structure and form (Zwicky 1962) and strives to "decompose a general problem or system into its basic variables, each variable becoming a contextual factor on a morphological box. When the values that each variable can assume are found, a set consisting of one value of each variable defines a solution to the problem or a species of the general system." (Hall III 1969). In our scenario of bundling, the morphological box can be used by researchers and practitioners to analyse the environment in which a bundling process is performed to reason on viable design alternatives that can be applied in this scenario. In other words, it helps to create a structured *field description* (Alexander 1970) of the environment that can inform the design of IT artefacts that can assist companies in the bundling task.

In addition to some basic properties of the bundling scenario, the morphological box for analysing bundling settings contains factors that refer to all layers contained in the 4-layer model of service bundles.

General Section

In the general section, the actors participating in the service system under study are identified. Actors can be commercial businesses, government agencies, or natural persons (Phan 2003). In addition, the prime intention to be realized with the bundling task is identified from a strategic perspective. For instance, the prime motivation for bundling in a scenario might be to increase customer value, to exploit up-selling or cross-selling opportunities, to lower the search costs of the customer, or to increase social welfare.

Layer 4: Customer profile

On Layer 4, a customer's understanding of his/her own preferences, needs, wants, and demands might be limited. Franke, Keinz and Steger (2009) argue that "true customer preferences may differ from expressed preferences on the basis of which the product is customized." Therefore, they argue that the preferences stated by a customer would contain a true component and an error term or random component (Simonson 2005). When this observation is mapped to the hierarchy of needs, wants, and demands as proposed by Baida (2006), this would mean that each of these constructs can potentially be known well or poorly by the customer. In order to still bundle an offering that is of value to a customer requires a process of preference elicitation to be conducted. Urban and Hauser (2004) present an approach to identify new customer needs in order to engineer innovative bundles. From the methods discussed in their literature review, we can infer that several strategies are viable to elicit customer needs, wants and demands. First, suppliers might identify customer requirements in qualitative or ethnographic interviews or workshops. Second, they may perform market research (such as conjoint analysis) and elicit the preferences (Backhaus et al. 2010) of customer segments. Third, they may analyse electronic business documents such as orders, requests for proposals in order to identify what a particular customer or sets of customers preferred in the past to reason about their current preferences. Fourth, suppliers can elicit customer preferences from interactions on virtual-adviser web-sites, as presented by Urban and Hauser (2004).

Layer 3: Bundle instances

On Layer 3, the actual bundling task for a particular customer is performed. The bundling process itself can be carried out by suppliers (such as in airline travel where the customer buys a transportation bundle, whereas the bundling process is completely performed by the airline carrier), by customers (such as on E-Commerce websites such as Amazon.com on which customers do the configurations in a self-service approach), or by both parties cooperatively (such as for configuring a new car in cooperation of car dealers and customers). We can refer to the strategies as a push strategy, a pull strategy, and a meet-in-the-middle approach (Mikkola 2007). The bundling process can be carried out in a mixed-bundling or in a pure bundling strategy (Guiltinan 1987). Pure bundling means that goods and services contained in a bundle cannot be selected and combined with other modules independently, while this is possible in a mixed bundling approach.

Bundles can be subject to different degrees of standardization (Mikkola 2007). We propose three categories here. First, the bundle can be a custom-fit solution that needs to be provided in an engineered-to-order fashion. Customer requirements here are complex and unique, such that suppliers cannot engineer pre-defined goods and services modules that are capable to satisfy customer demand. Second, the bundle might be put together is a mass customization approach, based on fitting together suitable goods and services components that have been predefined by the supplier. This approach is usually carried out in a configuration process that might be supported by configuration software tools. Third, the bundle might have been set up at build time, such that it can only be selected as an off-the-shelf offering that cannot be adapted any further. Directly related to the degree of standardization are the channels on which the bundling task can be carried out, i.e. synchronous in one place (e.g., in an interview or workshop), synchronous in different places (e.g., mediated by a video conferencing system or collaboration platform), or asynchronous in different places (e.g., mediated by a configuration

software tool). Depending on the complexity of the bundling task, different actors might cover the costs of the bundling task. When selecting from a portfolio of pre-defined off-the-shelf offerings, the supplier usually covers the costs of defining the bundles at build time and making them available from selection. In case of engineered-to-order bundles, the customer is frequently made to cover the costs of the engineering process, since this process is more similar to a consulting service than to picking some offering from a catalogue.

Bundling scenarios also differ with respect to the competitive situation in the marketplace, such as influenced by the concentration of companies in this industry sector, the substitutability of products, market size, and entry costs (Karuna 2007). With respect to the duration of the contract, bundles can be subject to offerings that are delivered instantaneously (such as many government services), along a period of hours or days (such as many holiday or transportation services), several weeks or month (such as many medical or education services), or even years or decades (such as many complex engineering or financial solutions). In addition to the duration of the contracts themselves, this might entail other properties also. Bundles that are subject to rather long contractual periods tend to be selected not only for their functional characteristics, but also for their non-functional properties, such as quality or costs. One typical manifestation is to compare the economic consequences (such as the total cost of ownership, TCO) of several bundles in order to identify the most beneficial one (Becker et al. 2009). For bundles that are subject to shorter contract periods, comparing the acquisition costs might be sufficient, whereas one-off services are bundles without spending effort on financial calculations.

Finally, the bundling process can be concluded in several ways, such as by starting the delivery process instantaneously, issuing an order document and send it to the supplier such that the bundle can be delivered when needed, or issuing a request for proposal in order to let the supplier work out a more detailed feasibility study that will result in an offer that is sent back to the customer.

Layer 2: Bundle types

Layer 2 is focused on bundling atomic services together at build-time, without reference to any particular customers. Atomic services might be put together for economic reasons or for functional reasons, for example to strive to realize a price premium by lowering search costs for their customers, or to exploit up-selling or cross-selling opportunities. This reasoning might as well be based on computing financial metrics such as cost data and willingness to pay data. If the bundles are defined for functional reasons, suppliers bundle services that need to be put together in order to be able to deliver the actual value proposition of the bundle. For instance, a service *Change Breaks* could not be performed without a *Spare Part Management* service. In addition, bundles might be defined at build time due to legal regulations.

Layer 1: Atomic types

Layer 1 is focused on engineering atomic service offerings. Setting up the up-front portfolio of atomic services can be done with respect to several paradigms. First, services can be defined because a demand for these services is identified in the marketplace (outside-in perspective). Second, a company can identify any services it provides inside the firm and can strive to commercialize them for customers outside their organization also (inside-out perspective). Third, services might have to be offered to comply with legal regulations. Typical examples can be abundantly found in the public sector, in banking and insurance companies, or in health care.

Table 1. Proposed morphological box for identifying the contextual factors in service bundling scenarios

Contextual Factors	Values				References
General Section					
Who is the service customer?	Commercial business	Government agency	Natural person		Phan (2003)
Who is the service provider?	Commercial business	Government agency	Natural person		Phan (2003)
What is the prime intention of service bundling?	Increase customer surplus	Create competitive edge or business value	Increase social welfare	Create market entry barriers	Guiltinan (1987); Lee and Kwon (2011); Nalebuff (2004)
Layer 4: Customer profile					
How well does a customer know his/her own "true" preferences?	Customer is not aware of preferences	Customer is aware of needs	Customer is aware of wants	Customer is aware of demands	Franke, Keinz and Steger (2009)

How are the customers' needs, wants, and demands identified?	From individual customer interviews and workshops	From conjoint analyses and other survey data	From quantitative analysis of business documents	From data on web-based searches (virtual-adviser data)	Urban and Hauser (2004); Franke, Keinz and Steger (2009)
Layer 3: Bundle instances					
What actor(s) perform(s) the bundling process?	Service Provider	Customer	Provider and customer in interaction		Mikkola (2007), Becker et al. (2009)
Which bundling strategy is applied?	Pure Bundling strategy	Mixed Bundling strategy			Guiltinan (1987), Legarreta and Echebarria (2004)
To what degree are service bundles standardized?	Low: Engineered-to-order solution	Medium: Configuration from modules/ mass customization)	High: Selection from off-the-shelf offerings		Mikkola (2007)
Which channel is used for bundling on an instance level?	Synchronous at one place	Synchronous, distributed	Asynchronous		Daft and Lengel (1986)
Who covers the costs associated with the bundling process?	Service provider	Service customer	A third party		
How intense is the competition in the market place?	Low	Medium	High		Karuna (2007)
How long is the contract period of the service bundle?	One-off	Several hours or days	Several weeks or months	Several years or even decades	Mayer and Argyres (2004)
Which criteria are used for bundling services?	Functional properties only	Non-functional properties only	Functional and non-functional properties		Becker et al. (2009)
What costs are included into the bundling calculus?	No costs included	Acquisition costs	Total costs of ownership		Becker et al. (2009)
How is the bundling task being followed up?	Request for proposal (RFP) is issued	Order is issued	Service delivery process is started		
Layer 2: Bundle types					
Is the predefined service portfolio designed for functional criteria?	Services are not bundled on a type level at all	Services are bundled based on economic reasoning	Services are bundled based on functional dependencies	Services are bundled based on legal regulations	Becker et al. (2009)
Is the predefined service portfolio designed for economic value?	No economic evaluation	Costs for providing services are estimated	Customer's willingness-to-pay is estimated	Costs and willingness-to-pay are estimated	Becker et al. (2011); Backhaus et al. (2010)
Layer 1: Atomic types					
Based on what reasoning are atomic services specified?	To provide value to a customer (outside in)	To commer-cialize know-ledge and skills (inside out)	To satisfy legal regulations		

ANALYSING THE BUNDLING TASK IN DIFFERENT SERVICE SCENARIOS

Different scenarios can be distinguished from each other based on building 2-tuples as permutations of the three actors businesses, public administrations and consumers. In the following, a scenario from the G2C and B2B domain will be described taking into account the aforementioned contextual factors.

Service Bundling in G2C scenarios: e-Government services provided to citizens

The following described case is embedded in a study that we conduct with an Australian State Government department, which is responsible for delivering all government services to its customers. This department currently investigates the benefits and required implementation steps to get from the bureaucratic model, where each department offers its services separately, to an integrated delivery model via a seamless, whole-of-government one-stop portal in order to evolve their maturity of online service delivery. The bundling of e-services in the public sector has been introduced by Gouscos et al. (2002), who describes how to package e-services for citizens aligned with life events that typically occur in one's life, such as 'Buying a house' or 'Getting married'. But bundles do not need to be only focussed on events, they can also be packaged according to topics or demographics (Kernaghan and Berardi 2001).

Bundles are created by the service provider for a natural person (a citizen in this case) to increase customer satisfaction and consequently ensure the adoption of the online channel for service delivery, which presents the most cost-effective way for governments to provide services. The main idea behind bundling is to enable citizens to find services more effective and efficiently as well as increase the delivery quality. Therefore, the main reasons for governments to offer service bundles is externally focussed on customer or citizen satisfaction and internally focussed on cost reduction.

Typically, the customer has a certain problem or a certain demand. Consequently, a service or service bundle is sought for that can fulfil the demand and provide a solution to the problem. Thus, the service provider, the government department in this case, provides bundles that are aligned to the way citizen search for information. In particular, the decision what services should be bundled together is based on previously conducted customer research, which focussed on eliciting the way its citizens go about finding information and what kind of services are perceived to be conceptually related. However, most citizens are unaware of services that might also be of relevance or importance to them in a certain situation. Therefore, the service provider might add specific services to bundles that are required to consume other services within the bundle, either because of existing policies or sequential dependencies of services. In the latter case, services are bundled because certain services require the output of another service (e.g. in order to consume the service *car registration*, identification needs to be provided, which may lead to the required consumption of the respective service).

Bundling on an instance level, which would either require the service provider to pick and choose from the portfolio of services and types of bundles in accordance with the identified needs/wants/or demands of a particular customer, or require the citizen to match services to fulfil the demand, or require provider and consumer to collaborate in order to find a suitable solution package or bundle, is currently not performed in the case presented. Government needs to provide services to all citizens. In the described case, the service provider faces millions of service consumers, who have heterogeneous needs, wants, and demands. Therefore, it is not feasible to only have dedicated, individual sessions to collaborative identify the services and bundles that are required. Nevertheless, the service provider can implement certain rules that restrict the potential search space for services. For example, the Canadian Government offers a website (www.canadabenefits.gc.ca) that shows only specific services for a certain consumer group based on provided answers to a certain questions that the citizen needs to answer first. The government of Hong Kong launched a personalisation platform, which enables users to access separate systems through a single sign-on as well as provides them the capabilities to personalise their web pages with short cuts to most frequently used services. However, personalisation requires a certain level of maturity in the delivery of e-government services, which has been reached by the two governments used as example (Accenture 2003).

In the described case, bundling takes place on the type level (level 2). The atomic services in the government's service portfolio are all defined previously, which are then used by the respective government department to create service bundles by analysing functional and non-functional properties of the services. The provider bundles and covers the cost of the bundling activity, such as identifying adequate bundles. As he is the sole provider of government services, the opportunity to switch service providers is rather limited for customers. Due to the nature of the relationship between the service provider and consumer, the bundle is typically offered free of charge and asynchronous as the bundles are predefined by the provider and then offered to the consumer. Typically the bundle is consumed once and there is no follow-up involved. Some transactional services might need a certain amount of time to successfully complete, but the contract period is rather short.

The services in the portfolio are typically specified to satisfy legal requirements and policies, but also to provide value to the citizen. Due to the nature of the service provision, the portfolio is not evaluated based on economic value to the department or government. The bundling of atomic services is based on evaluating the characteristics of the services as well as analysing research related to understanding the way citizen expect services to be conceptually bundled.

Service Bundling in B2B scenarios: Industrial solutions in the high tech investment goods sector

The case described in the following is situated in the German High Tech mechanical engineering industry. The company we have in mind is a global manufacturer of machine tools. The enterprise's physical goods portfolio ranges from high-tech machines for very complex drilling and lathing jobs to rather standardized machines for a broader market. The company possesses the densest service network in its industry. Services are offered by these service units world-wide and comprise the service and spare part business, interface products for remote maintenance, training and qualification, commissioning and second hand machine handling. The service division contributes about 30% to the group's entire turnover. The company's customers are manufacturing companies that buy their solutions in order to be able to manufacture their own physical goods. Therefore, the scenario is situated in the B2B sector.

The bundles sold by the company are purposefully set-up customer solutions, comprising physical goods components (e.g., the drilling machine) and various value-added services that are related to any of the machines lifecycle stages, ranging from pre-sales activities to after-sales services and end-of-life services. The prime objective of bundling offerings together into one solution is to provide a solution that is custom-fit to solve a problem for a customer. On the other hand, by bundling services and products together, the company strives to escape a tough competition on price with its competitors from low wage countries, as well as strives to exploit opportunities for up-selling and cross-selling.

Customers are faced with complex engineering problems that they want to have solved by buying a customer solution from the supplier. Frequently, customers know the general properties or their desired solution, but lack in-depth knowledge on their particular wants and demands. Instead, a valid solution needs to be identified in a requirements engineering process that is carried out in cooperation of the supplier with its customer. Since this process can be treated as an engineering consultancy service itself, the customer usually has to cover for the costs incurred by this process. Another option is that the costs of the requirements engineering process are charged, however, discounted from the purchase price if an order is issued after the engineering process.

Since the customer solution to be bundled is complex and potentially unique, it usually comprises pre-defined atomic services, pre-defined bundles, and additional components that are engineered-to-order for any particular customer. This means that a pure mass customization strategy without added new components to the catalogue of solutions is not feasible in most cases. Due to the high degree of specialization in this industry, the number of competitors able to provide their customers with solutions of similar value is quite limited, if they exist at all. The contract period of the bundles might span years or even decades. Therefore, a decision to buy a bundle represents a complex investment decision that is in most cases made on functional criteria as well as on advanced economic analysis, such as Total Cost of Ownership (TCO) Analysis or Net Present Value (NPV) Analysis. The bundling process itself is often carried out in close interaction of employees from both firms. However, preliminary activities might even be carried out in a distributed or even asynchronous fashion, mediated by software tools such as configuration tools that are running on the supplier's website. However, in these cases, the bundling process is frequently followed up by a tender process, in which the customer needs are matched with the bundled solution in more detail.

Suppliers bundle services on a type level in order to more convincingly argue for the integrated value of their offerings. For instance, an assembly is required to be bought with buying every machine that the company offers for sale. In addition, the supplier performs cost and TCO analysis to further improve its portfolio of goods and services. However, these analyses are often subject to data restrictions, since most of the solutions are unique which makes it difficult to reason of the underlying drivers of costs and profits. In addition, customer profiles are not feasible to set up for most customers, since each purchase transaction is unique. However, the company has a software system in place to assist them with compiling modular value bundles from pre-defined building.

Atomic services are defined from an outside-in perspective in order to provide customers with something that they would perceive as valuable. In addition, the company strives to define services in an inside-out fashion to provide their customers with something that they would not have expected. In addition, some services are motivated by legal regulations, such as product warranty.

DISCUSSION

With applying this morphological box on two real-world service system settings we demonstrated that the framework is applicable and helps to identify the underlying properties encountered in these settings. Comparing the two different service bundling scenarios, it becomes very obvious that the scope and the characteristics of the scenarios are quite disperse, albeit addressing the issue of what services should be packed together. In the G2C scenario, the primary objective of the government department is to bundle thousands of e-services in a way that makes it easier for citizens to understand and find services that fulfil their demand. Thus, bundling typically takes place on a type level (layer 2) and is performed by the provider based on service characteristics and empirical studies focussing on the way citizens expect services to be packaged. In the B2B scenario, the

engineering company bundles their physical goods with value-added services into unique offerings that are capable to satisfy the highly specialized needs of their clients. Bundling is mostly performed on an instance level (layer 3), since the exact customer needs cannot be identified independently of any particular customer. The bundling process is performed in close interaction of the supplier with its customers, and can span several weeks or even month until an adequate solution has been found. In addition, our results suggest that the bundling tasks on a G2C level are focused on individual instances of services whereas service bundles in an industrial B2B realm are rather focused on an instance level, based on which various services will be instantiated as needed.

An analysis of still other scenarios might reveal the properties of even other scenarios. On example would be service bundling in a B2C context, which we expect to be situated somewhere in between the scenarios discussed in this paper. In particular, we expect the service bundles in a B2C context to be quite standardized in order to increase the operational efficiency of the service process. In addition, we expect customers to know their own preferences, needs, wants, and demands better than a B2B customer in the engineering industries would, since services offered in a B2C context tend to be far less complex and less tightly integrated with physical goods. Consistently, we expect E-Business applications such as web-based bundling tools to be much more common to bundle services for consumers. The total set of services to include into bundles will likely be high, just like in the G2C scenario. However, we expect the underlying driving forces in a B2C context to be much more focused on generating competitive edge, profitability, and market value, whereas bundling in the G2C area seems to be focused on increasing social wellbeing or compliance with legal regulations.

CONCLUSION AND OUTLOOK

In this paper, we developed a morphological box that systematizes a set of contextual factors that influence the process of service bundling. The theoretical contribution is twofold. First, we systematized previous work on service bundling and product bundling into a 4-layered framework of service bundling, which informed the development of a morphological box. Second, the morphological box itself can be utilized to identify and reason on the differences and commonalities of service bundling scenarios. This is an essential step for designing, re-designing, and selecting IT artefacts for any service bundling scenario, since IT artefacts rely on a proper integration with their environment (Hevner et al. 2004).

This study is subject to some limitations. We focused on demonstrating the utility of the morphological box based on two application scenarios. In order to increase the validity and completeness of the morphological box, the analysed application scenarios were deliberately chosen from two industry sectors that feature quite different properties. However, service bundling is done in many more contexts, such that analysing additional scenarios is much needed to increase the theoretical saturation and validity of the proposed contextual factors.

Additionally, our future work will be focused on identifying methods that can support the service bundling task in different scenarios in the first place, in order to reason about which methods are applicable contingent on the properties encountered in different service bundling scenarios. For instance, we expect recommendation approaches such as collaborate filtering to be applicable for informing the bundling in government scenarios and in B2C scenarios, whereas these approaches have shortcomings in the B2B areas due to the uniqueness of customer needs, the complexity of the solutions, and a lack of mass transaction data. On the other hand, other techniques that are frequently used in the B2B realm might not be applicable or economically justifiable when having to deal with hundreds or even thousands of services simultaneously in B2C or G2C ecosystems. In our future work we will investigate this issue in more depth by identifying which of the contextual factors contained in the morphological box influence the applicability and selection of methods for service bundling.

Finally, we identify an intriguing prospect for future research in service bundling in moving from the company or dyad level of analysis to the network level. Since no company can own all the resources for satisfying their clients' needs alone, we expect that companies will increasingly partner with other actors in order to supply their customers with even more comprehensive offerings. This trend has been discussed under the headwords of service ecosystems or service marketplaces. However, IT artefacts for bringing these concepts to life still seem to be in their infancy, which leaves plenty of research opportunities still to be investigated.

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