Service Classification Scheme for Platform Businesses

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Abstract. This article addresses the shortcoming that existing service classifications cannot characterize services of platform businesses. To resolve this shortcoming, a literature review has been conducted, identifying existing service classifications and their attributes. Our comparison shows also that there are similarities between existing classification schemes with respect to customer and managing processes. To identify limitations of existing classifications, a use case about a platform business was analyzed. Our results show that traditional attributes are not sufficient to describe platform services. To settle this, we propose additional attributes that can also address services of platform businesses.

Keywords: Services, Service classification schemes, Platforms, Use Case

1. Introduction

Existing research has defined services in many different ways. Judd defines services as market transactions [1]. According to Hill, services represent 'a change in the conditions of a person or a good belonging to some economic unit'[2]. Mills and Turk describe a service as 'a performance or an effort rendered by one party for another' [3]. Other scholars consider services as performance and processes [4, 5]. Furthermore, there is comprehensive definition from Vargo and Lusch. They define services as 'the application of specialized competencies (knowledge and skills) through deeds, processes, and performances for the benefits of another entity of the entity itself' [6]. In addition, Rathmell explains services by distinguishing goods and services [7], and Edvardsson views services as a 'part of the wider concept product' [8]. As can be seen from this brief review, the definitions of services address different aspects in different research fields.

Moreover, service classifications have been considered in marketing [9-13], service industry and business management [14-17], operation studies [18-21], and economics [2, 22, 23]. In general, marketing and operation studies discuss service classifications and characteristics, to develop and improve processes of delivery services. Economics studies rather focus on outputs, to understand and distinguish between goods and services in their classifications.

Although most of existing classifications have been discussed to provide strategic and managerial implications, there are difficulties to use them empirically [24]. It is caused by the fact that existing service classifications are mostly derived from

Multikonferenz Wirtschaftsinformatik 2018,
March 06-09, 2018, Lüneburg, Germany

conceptual and theoretical approaches. To overcome this problem, a few studies (e.g., Glückler and Hammer [24], Shafti et al. [25]) have reviewed literature, to find a solid classification model that could be adopted across services, and combined the literature review with their empirical data.

Recently, new services emerged through platform-based businesses. A platform is a centre for connections between providers and customers, and its development is based on an information and communication technology infrastructure, comprising software, ubiquitous networks, and computing power [26, 27]. One of the well-known platform businesses is TaskRabbit. The company connects providers, who are willing to provide labor, to customers, who need help for everyday tasks such as cleaning, moving, and assembling furniture[1]. Through platform businesses, customers and providers join to conduct economic transactions freely and without any barrier. The technological availabilities of software, distributed computing, and the Internet make a platform possible [28]. As platform businesses have the potential to change the shapes of industries and even affect whole economic structures, it is highly relevant to check whether existing service classifications allow covering these services properly.

Following this discussion on emerging platform businesses in services and their relevancy, our research objective is to provide a service classification scheme by identifying service types of existing service classifications and by proposing new attributes that allow characterizing services of platforms. Related to this research objective, the research questions are: What are the similarities of existing classification schemes? What are the shortcomings of existing classification schemes with respect to platform services? What could be the definition of a comprehensive classification scheme for platform services?

To answer the research questions, a literature review is carried out, capturing similarities of existing classifications. Cook et al. [21] has been chosen as the basis for searching further journal articles. As the study of Cook et al. does not cover literature from 2000s, we extend the list by conducting forward citation search at Web of Science. Additional papers between 2000 and 2017 that developed classification schemes have been determined. From this literature review process, we obtain an understanding of which attributes exist and how they can be grouped into attribute types. In order to identify shortcomings of these attribute types, we explore a use case of a platform business that offers platform services.

As a result of this analysis, we provide a comprehensive list of attribute types of existing service classifications and a list of additional attribute types for platform services. These attribute types can be helpful to describe different service types and to are expected to explain transitions caused by technology developments.

The remainder of the article is organized as follows: In chapter 2, we provide an overview about services and service classifications of previous studies on services. Chapter 3 describes our research methodology and findings from our literature review. A case study is introduced in chapter 4 and discussed in chapter 5. Finally, chapter 6 concludes our study with a discussion on limitations and future research.

[1] Official website of TaskRabbit (https://www.taskrabbit.com/about)

2. Existing Research Directions on Services

2.1. Service Theories

One notable study of services in marketing defined the service-dominant logic (S-D logic). The S-D logic considers a service as 'a process of doing something for another party' [29] and a customer as 'a coproducer of service' [6]. By moving the goods-centered perspective of marketing into a service-dominant view, Vargo and Lusch determine value of services differently than in a goods-dominant logic (G-D logic). In the traditional G-D logic, value has been determined by value-in-exchange, while S-D logic defines it as value-in-use [6]. Therefore, service is viewed as a value co-creation by all involved actors in the logic [29].

Another study in operation management defined the unified service theory (UST). UST considers a customer as a significant input in the process of production [30]. Furthermore, UST also gives managerial implications for the production and extends customers' role in the service supply chain. Overall, these theories (S-D logic, UST) are important, as they consider customers as co-creators and co-producers of services.

2.2. Service Characteristics

With respect to characteristics, four service characteristics have been commonly known as natures of services: intangibility, heterogeneity, inseparability, and perishability. These characteristics are called IHIP [31, 32]. Typically used in service research, despite the fact that IHIP comes with a few limitations [33, 34]: First, although intangibility relates to the fact that services are not physically visible as goods [33], it gets criticized as some services (e.g., teaching) come entangled with tangible goods (e.g., teachers, books, and classrooms) [9, 34]. Second, as heterogeneity concerns services that vary in terms of service operations and customer experiences, it does not reflect the difficulties with respect to standardization through technology and equipment [32-34]. Third, inseparability is about simultaneous production and consumption. However, there are separable services that allow customers' absences at production such as laundry service and maintenance service of equipment and facilities [32]. Lastly, perishability means that services cannot be stored, as following service definitions that consider them to be processes and performances [7]. However, there is frequently mentioned example of ATMs, which store a standardized process of cash withdrawal [33-35].

2.3. Service Classifications

Customer contact has been considered as important in classifying services. Chase proposes the customer contact model that concerns customer's physical presence in service creation and classifies services into four groups: pure service, mixed service, quasi-manufacturing service, and manufacturing service [36]. In other traditional service studies, the model has been adopted to explore service organization designs [37] and has been extended by Mersha, who considers that communication

technology affects to contact time [19]. Wemmerlöv presents a framework with customer contact levels and service process characteristics being rigid or fluid [20].

With respect to processes, Chase defines customer contact as customer's presence [36, 38], while Schmenner discusses that customers may have little interaction with service providers in processes, even if they are present physically. Schmenner proposes a service process matrix with a degree of customer interaction and customization and a degree of labor intensity [14, 39]. In addition, Silvestro et al. point out that service contact could consist of two elements as frequency and duration [15]. Regardless of the perspective on physical presence of customers during services, it can be said that one significant classification type on services is performed based on customer contact.

Other studies take on a customer-centered perspective and consider service activities (actions) for classifying services. For example, Lovelock [9] and Kelley et al. [18] mainly focus on the level of customization and the nature of service actions. Cunningham et al. capture how customers recognize and classify services [12, 40-42]. Besides, there is a mathematical model that is called 3P + C (provider, process, place, and customer) [16, 43]. Zysman et al. distinguish ranges of service activities [44], and Altmann et al. propose a new definition of service networks by identifying relations between actors in service context [45]. Furthermore, Maglio et al. focus on values that are created from relationships between providers and customers [46], and Hennerberg et al. have identified service networks from relations of services and products [17].

Even though previous studies take various approaches to classify services, their service classifications are mostly suggested conceptually and would not be sufficient to embrace other than their own domains.

3. Towards a Consolidated Classification Scheme Unifying Existing Service Classifications

3.1. Methodology

As services have been defined and classified differently depending on their foci, we believe that a literature review is a useful method, to find unrecognized aspects and to address current trends in a more inclusive service classification scheme. Webster and Watson provide a guideline for writing a literature review, stating that a thorough literature review can be a way of facilitating theory development, welding various research topics, and revealing unidentified research objects [47]. They recommend three steps to determined review materials: first, finding major contributions from leading journals; second, finding articles by checking references of articles identified in step 1 (going backward); and lastly, finding articles by checking citations to the articles identified in step 1 using Web of Science (going forward) [47].

Following Webster and Watson, we explore well-known service studies with respect to service classification schemes (Figure 1). Among them, Cook et al. [21] provide the most comprehensive perspective on the topic. Although the paper provides a fine start that can lead to major literature on service classifications, it includes studies only until 1990s. To find more recent studies, we identified journal

papers using forward citations of major studies listed in Cook et al. on Web of Science (WoS)[2]. We use WoS for searching articles as Webster and Watson's recommendation.

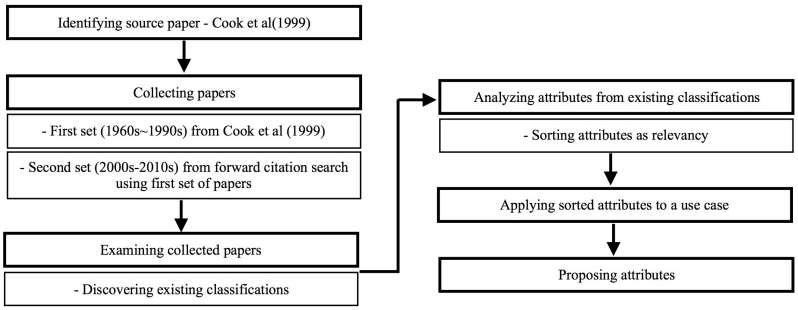

Figure 1. Research Framework

As we wanted to observe direct connections between frequently used studies and more recent studies, we conducted forward citation searches. A total of 1,126 journal articles were found since the year 2000. The abstracts, keywords, and research fields of those journals were examined. 84 articles were considered for a detailed analysis with respect to service classifications. The analysis result of all 84 articles revealed that 19 studies developed and proposed their own classifications schemes. Overall, 35 articles were collected to be examined in this study. Of those 35 articles, 16 articles were proposed in the 1990s and 19 since 2010s.

3.2. Analysis of Attributes Used in Classification Schemes

Based on the 35 articles about service classifications, we analyzed attributes that were used to classify and segment services. Attributes have been reviewed with respect to relevancy and similarity, and have been categorized into attribute types. For example, attributes, such as contact, customer contact, client contact, degree of contact, and contact intensity, were covered with the general type 'degree of customer contact'.

Table 1 shows that 13 classifications have used an attribute to reflect customer contact. They mostly followed an identical notion of Chase's that describes customer's physical presence in a service creation. We grouped these attributes under the attribute type 'degree of customer contact'.

In 11 classifications, attributes appeared that have addressed the concept of alteration of processes for meeting customers' needs in services and that describe the level of modification of services. The attribute type 'degree of customization' aggregates these attributes.

[2] Final accessed date - 19/July/2017 (https://apps.webofknowledge.com)

Table 1. List of Attribute Types

Attributes	#	*Literature*
Degree of customer contact	13	Chase (1978), Maister&Lovelock (1982), Lovelock (1983), Haywood-Farmer (1988), Bowen (1990), Mersha (1990), Wemmerlöv (1990), Silvestro et al. (1992), Cunningham et al. (2005), Shafti et al. (2007), Theotokis et al. (2008), van der Valk & Axelsson (2015), Jaakkola et al. (2017)
Degree of customization	11	Maister&Lovelock (1982), Lovelock (1983), Schmenner (1986), Haywood-Farmer (1988), Bowen (1990), Silvestro et al. (1992), Cunningham et al. (2005), Shafti et al. (2007), Cunningham et al. (2008), Liu&Wang (2008), van der Valk&Axelsson (2015)
Service process	10	Lovelock (1983), Zvegintzov (1983), Wemmerlöv (1990), Silvestro et al. (1992), Kellogg&Nie (1995), Buzacott (2000), Cunningham et al. (2005), Johansson&Olhager (2006), Carlborg&Kindström (2014), van der Valk&Axelsson (2015)
Object of service	9	Murphy&Enis (1986), Silvestro et al. (1992), Kellogg&Nie (1995), McDermott et al. (2001), Cunningham et al. (2005), Liu&Wang (2008), David (2014), van der Valk&Axelsson (2015), Cusumano et al. (2015)
Service characteristics (IHIP)	9	Lovelock (1983), Murphy&Enis (1986), McDermott et al. (2001), Cunningham et al. (2005), Shafti et al. (2007), Cunningham et al. (2008), van der Valk&Axelsson (2015), He et al. (2016), Jaakkola et al. (2017)
Degree of application / implementation	9	Thomas (1978), Silvestro et al. (1992), McDermott et al. (2001), Wynstra et al. (2006), Theotokis et al. (2008), Liu&Wang (2008), Glückler&Hammer (2011), van der Valk&Axelsson (2015), Jaakkola et al. (2017)
Labor intensity	9	Thomas (1978), Mills&Margulies (1980), Schmenner (1986), Haywood-Farmer (1988), Silvestro et al. (1992), Shafti et al. (2007), Lee&Park (2009), Wünderlich et al. (2013), Roels (2014)
Degree of interaction	7	Mills&Margulies (1980), Schmenner (1986), Haywood-Farmer (1988), Cunningham et al. (2005), Shafti et al. (2007), Roels (2014), van der Valk&Axelsson (2015)
Degree of standardization	7	Bowen (1990), Buzacott (2000), Cunningham et al. (2008), Liu&Wang (2008), Roels (2014), van der Valk&Axelsson (2015), He et al. (2016)
Customer participation	6	Larsson&Bowen (1989), Shafti et al. (2007), Wünderlich et al. (2013), Carlborg&Kindström (2014), Roels (2014), van der Valk&Axelsson (2015)
Diversity	4	Shostack (1987), Larsson&Bowen (1989), Glückler&Hammer (2011), van der Valk&Axelsson (2015)
Place	3	Silvestro et al. (1992), Shafti et al. (2007), Liu&Wang (2008)
Complexity	3	Shostack (1987), van der Valk&Axelsson (2015), Jaakkola et al. (2017)
Volume	2	Johansson&Olhager (2006), Lee&Park (2009)
Judgement	2	Cunningham et al. (2005), Shafti et al. (2007)
Convenience	1	Cunningham et al. (2005)
Contingency	1	Liu&Wang (2008)
Riskiness	1	Cunningham et al. (2005)
Switching	1	Cunningham et al. (2005)

Variations of the attribute type ‘service process’ have been found in 10 classifications, covering distinct qualities of delivery and processes. Most of the classifications have discussed service processes under the assumption of physical contact between customers and providers.

Nine studies brought the aspect of results of services into their classifications. They covered outcomes that customers get from services. We categorized them with the attribute type ‘object of service’.

‘Service characteristics (IHIP)’ comprises attributes on the nature of services. These attributes, which were mentioned 9 times in classifications, are subsets of IHIP.

Attributes, which concern the utilization of technology, knowledge, and equipment in services, were put into a group of attributes named ‘degree of application and implementation’. Nine classifications used this type of attribute.

The attribute type ‘labor intensity’ concentrates on service providers’ activities and how services depend on individual workers. It has been used in 9 studies.

Four of the studies, which also used labor intensity, consider also the depth of interactions between customers and providers. In total, seven studies applied this notion, which we named ‘degree of interaction’.

An attribute regarding the level of routinization and standardization can be found more frequently in literature after 1990. In total, seven classifications considered this attribute type, which we named ‘degree of standardization’.

With the increasing attention on customer’s role in services since the year 2000, six classifications considered the attribute type 'customer participation'. It describes customers’ activities and roles for joining services.

Four classifications focused on attributes about the variety of customer’s demands. We named this attribute type ‘diversity’.

Though expressed differently, three classifications followed a very similar concept of ‘place’. They expressed focus of a service to be at the front office, back office, or a virtual space.

The attribute type ‘complexity’, which has been addressed three times in classifications, describes the complexity of the provisioning of a service.

The remaining six attribute types (i.e., volume, judgement, convenience, contingency, riskiness, switching), which appeared less than three times, considered a unique quality in each study.

4. Application of Attribute Types to the Use Case TaskRabbit

TaskRabbit is a company, which has been founded in 2008. It connects platform users: those (Taskers), who are willing to provide labor, and customers, who need help with tasks (e.g., cleaning, moving, and assembling furniture). TaskRabbit, which advertises itself as a “same-day service platform”, can be considered a platform service provider. TaskRabbit is useful as a case study, as its service does not require any tangible products and does not involve complex transactions between its users.

With the help of attribute types listed in Table 1, we can describe the service of TaskRabbit in detail. For establishing connections between customers and taskers, TaskRabbit's platform users do not need to be present physically, when the transactions on the platform happen. Therefore, it is hard to measure customer contact between TaskRabbit and users. TaskRabbit provides information and connections using standardized processes to both types of its platform users. At the same time, the

platform can also be seen as providing customized services, since platform users can decide on the service and its provisioning according to their particular needs. In addition, as TaskRabbit is a platform that connects both types of users, a relationship between a customer and a tasker can hardly be defined as unidirectional. Moreover, it is not only hard to measure the degree of contact but also the degree of interaction. Furthermore, as customers are provided labor for their needs by taskers, who are hired temporarily by TaskRabbit, TaskRabbit can be rated as high 'labor intensity'.

Based on the TaskRabbit's service description that followed our consolidated classification scheme (Table 1), we got a solid classification of the service of TaskRabbit. However, there are three properties of the TaskRabbit service, which could not be described accurately by the attribute types shown in Table 1.

First, existing classification schemes assumed that service processes require physical contact between customers and providers [10, 14, 45, 48, 49]. However the TaskRabbit case showed that the service contract conclusion can be performed without any physical contact between customer and provider. Moreover, there are platform services, which do not even require any physical contact for the entire service process, including contract conclusion, provisioning, and delivery. Examples of these platform services are online services such as music streaming, video on demand online, and cloud services. The lack to express this is a shortcoming.

Second, in existing classification schemes, the degree of customization and the degree of standardization could not be rated as high at the same time. If one service has been rated as highly customized, the service could not be rated as standardized [14, 31, 32, 50]. However, businesses, which are based on platforms such TaskRabbit, were able to provide not only standardized services through the availability of public domain software, ubiquitous Internet, and computing power [26, 27] but also highly customized services (e.g., openness of services and flexibility of services) through digitalization and automation [28]. This is a shortcoming of existing classifications.

Third, although interactions between customers and providers have often been discussed [51-53], the environment (virtual world or real world), in which the interactions have happened, did not get sufficient attention. Existing classifications have the shortcoming of only considering service transactions that can either occur in the real world or in the virtual world. Combinations of occurrences in the real and virtual world (as for the case of the platform TaskRabbit service) cannot be expressed.

5. New Attribute Types for Platform Services

From the analysis of the TaskRabbit use case in chapter 4, it became clear that the attribute types of existing classifications are not sufficient to describe platform services. To resolve the three shortcomings identified in chapter 4, additional attribute types are needed for comprehensively describing platform services. In detail, we propose to add three new attribute types to the classification shown in Table 1:

The first new attribute type, which is related to the first shortcoming listed in chapter 4, describes the 'degree of involvement' of actors in the service process,

covering the quality of interaction and the kind of information exchanged. The 'degree of involvement' is used to express the quality of interaction with the actors.

With respect to the second shortcoming listed in chapter 4, if some people are familiar with digital devices, they may join a platform with a higher likelihood (as also in the case of TaskRabbit). Knowing how to use a technical device is a kind of competency (skills and knowledge) as described by Vargo and Lusch. This new attribute type is called 'degree of competency'. A high 'degree of competency' allows the platform user to use a service more effectively and to obtain a more customized service through the interaction. Consequently, the higher the 'degree of competency" is, the higher the 'degree of involvement' can be.

We believe that it is important to consider 'service scene' as another new attribute type for classifying platform services, addressing the third shortcoming identified. 'Service scene' is defined as a sequence of continuous actions in the service process that can take place in the virtual world or the real world. This definition allows for a combination of occurrences in the virtual world and the real world. This attribute type helps describing where services are agreed upon, provisioned, and delivered.

6. Conclusion

This research addressed shortcomings of existing service classifications. For this, we conducted a literature review, studying existing service classifications and their attributes. There were similarities between existing classification schemes about considering customers and managing processes. To identify limitations, existing attributes were applied to the platform service TaskRabbit. We found that traditional attributes are not sufficient to explain the TaskRabbit use case. Therefore, we proposed three additional attributes, which can cover emerging platform services, and a consolidated service scheme.

There are a few limitations to this research. First, there may be articles that are not included in the analysis, although we followed a comprehensive methodology to find all relevant studies. The cause might be the focus on only one database, namely Web of Science. Second, as we analyzed the classification schemes and attributes based on our interpretations, a quantitative method using text and clustering analyses might be considered less subjective.

In conclusion, although there are many service classifications, these classifications fail to explain current transitions from traditional services to pure online services (e.g., video rental shop to online streaming) caused by technology developments. To understand platform services, we need an appropriate service classification scheme.

7. Acknowledgements

This research was conducted within the project BASMATI (Cloud Brokerage Across Borders for Mobile Users and Applications), which received funding from the ICT R&D program of the Korean MSIP/IITP (R0115-16-0001) and the European Union’s Horizon 2020 research and innovation programme under grant agreement no. 723131.

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