Derivation of a service typology and its implications for new service development

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Abstract

With the increasing importance of new services, various models for new service development have been created in research. An analysis has shown that such models typically consist of a development process covering activities from idea generation to market launch – implicitly claiming that one single process fits to all kind of services. However, factors like industry, company size, customer segment, types of services and innovation culture might have an impact on the way how new services are developed, but are rarely incorporated into the existing new service development processes. This paper addresses this gap and investigates, in particular, the relationship between different types of services and their development processes. In order to do so, it presents one of the first service typologies that have been developed from a comprehensive empirical data set from 1,333 companies operating in different industries and countries. Moreover, this paper contributes by showing that the type of service has a considerable impact on how companies develop their new service offerings and the preliminary findings indicate a need for further research on flexible and configurable models for new service development.

Keywords: typology, types of services, new service development, process model

1. Introduction

As services have become increasingly important for the economy, there has been a significant rise in the competition in many service industries over recent years. Formerly sluggish markets are changing, new participants are appearing on the scene, and there is an unmistakable increase in market dynamics. In this kind of environment, service providers are no longer able to distinguish themselves solely by means of cost benefits, image, or quality advantages. Rather, differentiation via an innovative range of new services is becoming a significant competitive advantage (Gustafsson and Johnson, 2003; Storey and Hull, 2010) and the source of future growth (e.g. Sawhney et al., 2004). The key challenges are primarily to provide the market with continually improved or new services, by reacting more quickly than competitors and, at the same time, fulfilling customers' needs and expectations.

With the increasing importance of new services in everyday business, there has also been an intense academic debate with regard to this topic and some overview papers have been focusing on state-of-the-art new service development processes (see e.g. Jong and Vermeulen 2003; Kindström and Kowalkowski, 2009). Previous research has identified a number of, often normative descriptions of how new service development (NSD) and service innovation (see e.g. Menor and Roth, 2008; Paswan et al., 2009; Edvardsson et al., 2013)

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should be performed, most often without a solid empirical analysis. But, what basic assumptions and service typology form the basis for these models?

In particular, a lot of models have emerged which propose procedures and methods for the systematic development of new services (see figure 1), often very similar to new product development (NPD) models (see e.g. Griffijn 1997). The basic concept consists of undertaking a detailed documentation of project flows, project structures, and project responsibilities, thereby assisting with the planning, management, and monitoring of development projects (e.g. Scheuing and Johnston, 1989, Ramaswamy, 1996; Alam, 2002; Ginn and Varner,2003; Sakao and Shimomura, 2007).

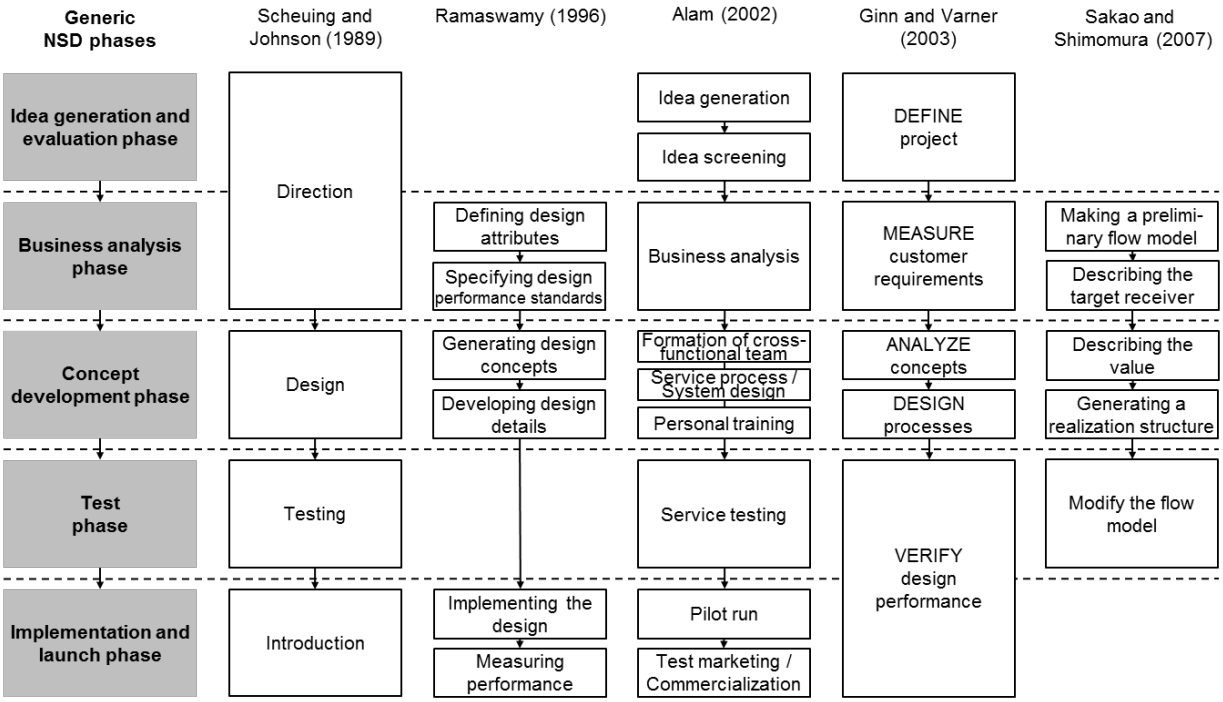

Figure 1: Comparison of selected process models for new service development

The models shown in Figure 1, as well as nearly all the others mentioned in the literature, consist of a linear process that normatively describes the phases and activities needed, ranging from the development and design to the launch of a service – implicitly claiming that one single process fits to all kinds of services. However, the services sector is composed of a wide variety of different activities ranging from postal services to brain surgery. Service researchers have agreed that the range of services is too diverse to allow a meaningful analysis of the entire field, and suggests different marketing and management implications for different types of services (e.g. Clemes et al., 2000). A review of empirical research on NSD nevertheless reveals that empirical studies on NSD have largely focused on certain service industries, particularly financial services (e.g. Storey and Easingwood 1996; Syson and Perks 2004), and the differences between types of services have received very little attention. Configurable process models, as found in both product development as well as in software engineering, are virtually almost unknown in service research. But what is the reason for this? Can all services really be developed using the same methods? Or has this topic simply not been adequately addressed by research?

To address these questions that have remained unanswered in extant NSD research, this paper investigates the relationship between different types of services and their development processes. By drawing on a an extensive, cross-sectoral survey study, this paper contributes

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to clarify the extent to which different approaches exist in the development of new services, at least regarding its practical application within companies. The question of what impact the type of service has on its development is of particular interest. This paper makes a pivotal contribution to NSD research by providing an empirically derived service typology and demonstrating differences in NSD processes between service types.

2. Derivation of a service typology

If the service sector is viewed as a whole, it is possible to detect a high degree of heterogeneity among the services provided. In order to be able to take this diversity into account to an adequate degree, it is necessary to carry out appropriate structuring of the particular service in question. The classification into different industries initially seems an obvious criterion for analysis. However, when examined more closely, it becomes apparent that this criterion is not particularly meaningful as specific markets in the service sector are increasingly merging with one another. In addition, it is also true that one and the same service is frequently provided by companies from different industries. Customer care services can be seen as a typical example. Indeed, there is hardly an industry left where call centers, help desks or hotlines are not a feature.

Hence, it does not seem expedient to look at differentiation according to different industries for this study. Rather, it appears more promising to take a look at differentiation according to the type of services, whereby the industry in which the service provider is active does not play a role. A wide range of typologies for the service sector exist in the literature (for an overview, please refer to e.g. Cook, Goh and Chung, 1999), but, on the one hand, only very few have been empirically tested and, on the other, most of these typologies have not been created in the context of new service development. Therefore, a typology that structures services according their characteristic features is needed.

First of all, known typologies were analyzed. The basis for this was the state-of-the-art survey by Cook, Goh and Chung (1999), which was supplemented using current approaches (e.g. Buzacott, 2000; Yi and Baumgartner, 2004; Sphorer, 2006; Viitamo 2007). This resulted in a list of more than 50 different criteria that have been used to date in literature on the typologization of services. As a second step, this list was discussed in an expert workshop; finally filtering out six criteria that were to form the basis for a typologization, as follows:

- Degree of labor intensity in service delivery
- Degree of technology intensity of services
- Degree of customization of services
- Degree of customer interaction in service delivery
- Degree of complexity of services
- Degree of emotional response from customers

A study on new service development carried out among 1,333 companies was used to gain information on the role played by selected criteria on real services in everyday business. The companies surveyed in six European countries (Austria, Finland, Germany, Italy, Sweden, Switzerland) and in Mexico were asked to name the services that had been developed most recently and to characterize them according to the selected criteria. More in general, the study investigated three main areas: strategy and organization of NSD, NSD projects as well as NSD performance. The participants of the study represent companies of different sizes coming from a large variety of service and manufacturing industries.

Once the data on the typology criteria had been recorded, the next step was to carry out a correlation analysis with the aid of the Spearman's correlation coefficient (see Table 1). Here, it is interesting to determine the extent to which the criteria chosen by the experts are independent or mutually dependent.

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	Labor	Technology	Custom.	Interaction	Complexity	Emotion
Labor	1.00	-0.06	-0.219**	0.293**	0.163**	0.197**
Technology		1.00	0.099**	0.089**	0.342**	0.081**
Customization			1.00	0.393**	0.298**	0.265**
Interaction				1.00	0.281**	0.371**
Complexity					1.00	0.234**
Emotion						1.00

Table 1: Correlation of the criteria for a typology

It can be stated that there is generally low to medium correlation within the criteria examined. The highest values are reached with +0.393 (between customization and interaction), +0.371 (between interaction and emotion), and +0.342 (between complexity and technology).

Although the correlations are not very high, the criteria in this format are not used to create the service types. The use of these criteria would result in certain aspects being assigned a disproportionately strong influence. For example, customization, interaction, and emotion appear to have a closer correlation and to be mutually dependent to a certain extent. Taking all these three criteria into the next steps of the analysis would have a disproportionately strong impact on the shared influence on which this is based.

Due to this fact, a reduction of shared influences was carried out with the help of a factor analysis before actually generating the service types. This resulted in the original six typologization criteria being reduced to a smaller number of independent factors, albeit with some loss of information as the complete variance can no longer be explained. A principal component analysis of the data available was carried out in accordance with the Varimax method, which then ultimately results in two virtually independent factors. In order to be able to analyze the correlation between the original criteria and the factors ascertained, the factor loadings were examined (see Table 2).

	fac1	fac2
Labor	**0.645**	-0.141
Technology	-0.081	**0.869**
Customization	**0.645**	0.235
Interaction	**0.758**	0.129
Complexity	0.349	**0.708**
Emotion	**0.630**	0.142
Interpretation:	*Contact intensity*	*Technological complexity*

Table 2: Results of the factor analysis

The greatest challenge in carrying out the factor analysis is undoubtedly interpreting the new factors. With the case in hand, it is interesting to note that the first factor has a strong correlation with the criteria labor, customization, interaction, and emotion. It seems that this factor primarily characterizes services that are rendered by people or for people. Consequently, the first factor should be referred to below as contact intensity, as it evidently reflects a close mutual relationship between customers and employees. The second factor is characterized by especially high factor loadings for the criteria technology and complexity. For the purpose of simplicity, this factor will be referred to below as technological complexity.

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As a result of the factor analysis, it should be noted that the six criteria mentioned at the outset have been reduced to two predominantly independent factors: notably, “contact intensity” and “technological complexity.” These serve to characterize the services examined as part of the empirical study and to summarize them as appropriate types according to the things they have in common.

The hierarchical cluster analysis in accordance with the Ward method was chosen for the classification of service types, which means that the above factors are used to set up clusters of companies that demonstrate a very high degree of similarity in the services they offer. Once the cluster analysis has been carried out, the increases in the sum of squared errors give the number of four clusters as the most favorable result. Here, as with the factor analysis carried out above, the question of an appropriate interpretation of the specific clusters also arises. To help with this, the mean values of factors can be used for the respective clusters, i.e. the mean value is calculated and analyzed for both factors in each cluster. The mean values of the factors can be seen in Table 3.

	Cluster 1	Cluster 2	Cluster 3	Cluster 4
fac1 (“contact intensity”)	-0.358	-0.828	1.285	0.684
fac2 (“technological complexity”)	-1.380	0.480	-0.912	0.502

Table 3: Mean values of factors for each cluster

Using the factor analysis and the cluster analysis, it is now possible to derive the desired typology. To this end, both factors determined are used as dimensions for the typology, and the four clusters are then allocated according to the interpretation in Table 3. Figure 2 shows a visualization of the typology.

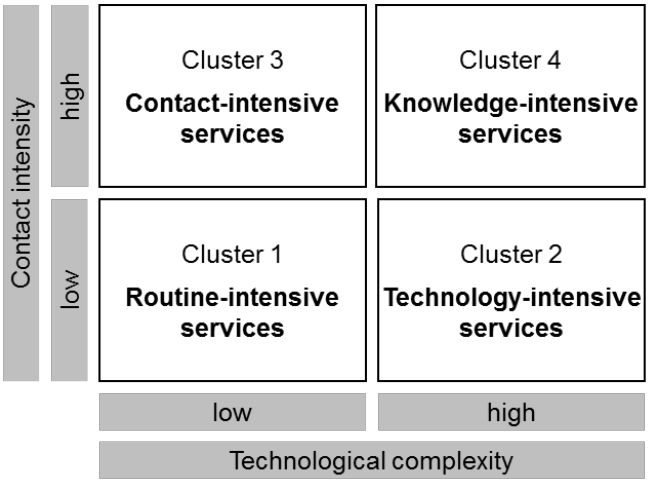

Figure 2: Empirically-derived typology of services

As the companies which took part in the survey were also asked to name services they had developed, it is also possible to determine exactly which services are represented in the specific clusters. The overall result can now be described as follows.

Cluster 1 (“routine-intensive services”):
The services falling into the first cluster are distinguished by the very low mean value for technology complexity and also have a low value for contact intensity. When the survey data was analyzed, it also emerged that many of the services were heavily standardized and

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marked by the high incidence of repetition. Consequently, the term routine-intensive services was given to this cluster. Services in this cluster primarily include services provided by hotels, the wholesale trade, real estate, transportation services, banking and insurance.

Cluster 2 (“technology-intensive services”):
The second cluster has a high value in terms of technological complexity and the lowest value for contact intensity. The services mentioned by the companies taking part in the survey also show that these are frequently technical services, as well as product-related services. For instance, some services included in this cluster are engineering, maintenance, repair, technical support, energy management, and IT services.

Cluster 3 (“contact-intensive services”):
The third cluster is dominated by services with the highest degree of contact intensity on average, whereby these services are also deemed to be least complex from a technological point of view. Examples of these services from the companies surveyed include: training, retail, healthcare services, catering, call centers, and market research.

Cluster 4 (“knowledge-intensive services”):
The fourth cluster comprises services that not only have a high degree of contact intensity, but are also technologically complex. An analysis of the results from the study reveal that these are predominantly services from the field of design services, medical services, and coordination services, which are typically highly customer-specific and are delivered in close contact with the customer.

The intermediate result is that it was possible to derive a service typology by means of a widespread empirical study using a factor analysis and a cluster analysis, which largely reflects the assessments made in practice. Consequently, four typical types of services can be identified, which can be termed as routine-intensive services, technology-intensive services, contact-intensive services, and knowledge-intensive services.

3. Service typology and new service development

A typology is not an end in itself. It should be seen more in the light of structuring a complex area of knowledge and simplifying it in order to be able to better explain interesting correlations. The study on which the aforementioned typology is based was carried out first and foremost in order to ascertain the current situation of new service development in business practice. Now the exciting question arises as to what extent various types of services actually have an impact on the development of services.

For the purpose of further analysis, suitable variables from the study were chosen which would describe strategic aspects of service development, as follows:

- S1: Explicit strategy for new service development,
- S2: Target group for new service development,
- S3: Formalization of new service development processes,
- S4: Success of new service development.

Additionally, variables were examined that would mark the different phases of service development:

- P1: Idea generation and evaluation phase,
- P2: Business analysis phase,
- P3: Concept development phase,
- P4: Test phase.

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A multinomial logistic regression model was created in order to analyze the correlation between the four service types and new service development variables. What appears to be the simplest service type, routine-intensive services, was selected as the reference category because it has low contact intensity and is also characterized by a low degree of technological complexity. The results of the multinomial logistic regression are shown in Table 4.

Type of service	Independent variables	Estimate	Standard Error	Wald	Sig.	Exp(B)
Knowledge-intensive services	S1	-0.635	0.240	7.019	0.008	0.530
	S2	0.170	0.058	8.587	0.003	1.185
	S3	0.251	0.051	24.070	0.000	1.285
	S4	1.030	0.488	4.456	0.035	2.801
	P1	-0.005	0.014	0.125	0.724	0.995
	P2	-0.019	0.014	1.715	0.190	0.981
	P3	0.027	0.013	4.425	0.035	1.028
	P4	0.008	0.018	0.204	0.651	1.008
Technology-intensive services	S1	-0.652	0.235	7.664	0.006	0.521
	S2	0.071	0.056	1.588	0.208	1.074
	S3	0.216	0.050	18.518	0.000	1.241
	S4	1.104	0.483	5.234	0.022	3.016
	P1	0.003	0.014	0.053	0.817	1.003
	P2	-0.004	0.014	0.072	0.788	0.996
	P3	0.038	0.013	8.606	0.003	1.039
	P4	0.021	0.018	1.377	0.241	1.021
Contact-intensive services	S1	-0.086	0.185	0.215	0.643	0.918
	S2	0.262	0.071	13.491	0.000	1.299
	S3	0.045	0.060	0.568	0.451	1.046
	S4	1.851	0.589	9.890	0.002	6.369
	P1	0.004	0.015	0.055	0.814	1.004
	P2	-0.037	0.017	4.590	0.032	0.964
	P3	0.007	0.015	0.224	0.636	1.007
	P4	-0.024	0.021	1.237	0.266	0.977

Reference category: Routine-intensive services
Chi-square = 122.832 ($p<.01$), $R^2 = 0.178$ (Nagelkerke)

Table 4: Results from multinomial logistic regression

Some significant correlations can be observed. For instance, knowledge-intensive services and technology-intensive services have a higher degree of formalized processes for service development (S3). In both types, technological complexity plays a role and this might explain that the associated higher risks in terms of time and costs leads to the companies organizing their development processes according to detailed principles. This is roughly comparable with product development in technology-intensive manufacturing companies.

There is also a correlation with regard to the target groups of newly developed services, with contact-intensive services and knowledge-intensive services showing particularly strong correlation. New services are developed more frequently for new target groups for both of these service types (S2). The reason might be that improved and more direct interaction with

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customers results in ideas, concepts and options for new services, which are then implemented by the service providers.

The question regarding success of service development is also integrated into the analysis. This is measured in the study by determining the percentage of services that completed the full cycle of concept to implementation and were still in operation after the first year. Overall, the study shows that 41 percent of the new services do not survive on the market on a long-term basis. In contrast to routine-intensive services, the other three service types all show significantly higher success rates.

Clear differences are also evident when examining the phase of development. In the context of the study, companies were asked to give the development time needed for typical development phases as a percentage. A greater degree of focus is placed on the concept development phase (P3) by technology-intensive services and knowledge-intensive services. It can be assumed here, as was the case concerning the formalization of the development process, that the high degree of technological complexity featured by both types means that more time has to be invested in the technical design of the new service.

There is yet another difference with contact-intensive services, where significantly less emphasis is put on the business analysis phase (P2), which concentrates on the analysis of markets and customers. Contact-intensive services require less time for this aspect. This may be due to the fact that the permanent interaction with customers during the service delivery leads to an understanding of their needs and expectations and therefore less effort for this task during service development.

All in all, the analysis reveals a string of correlations between the type of service and its development. In practice at least, it appears that various priorities are established for the development process, depending on the service type in question. The extent to which theoretical models for new service development established to date are actually useful, or whether indeed new flexible and configurable models need to be provided, remains an interesting research question for the future.

4 Conclusion and outlook

The purpose of this paper was to investigate the relationship between different types of services and their development processes. A survey on new service development, in which 1,333 European and Mexican companies participated, formed the empirical basis for the analysis. Respondents described and characterized their newly developed services. In particular, they classified their services using six criteria that were elaborated in an expert workshop prior to the survey. Empirical data revealed some dependencies between the six criteria, and a factor analysis was used in order to derive independent criteria for subsequent typologization. Finally, with the use of cluster analysis, four different “types” of services were identified and used for investigating their influence on new service development. The typology developed in this paper represents one of the first service typologies that have been derived from a comprehensive empirical data set.

The results reinforced the assumption that development strategies and processes vary depending on the type of the service developed, at least in business practice. This finding nuances the current understanding on NSD practices that tends to assume that “one size fits all” and hasn’t provided insight into the differences between types of services. Consequently, the question arises as to whether research needs an additional focus when investigating patterns and tools for new service development. On the one hand, it would appear useful to create models for the development of services that can be adjusted where required, i.e. depending on the service in question, the models would have to be able to select adequate

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development steps, propose suitable methods and tools, and submit recommendations for the design of the development process (e.g. a warning for critical activities).

On the other hand, this study was limited to the type of service and its implications for new service development. Nevertheless, it can be assumed that further implications exist that have a major effect on the development of new services. For example, factors such as company size, customer segment, or innovation culture. The investigation into detailed effects on the design of service development processes is something that should be examined in future studies.

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