Service Innovation

An Empirical Study on the Impact of Different Service Innovation Processes and Methods to Entrepreneurial Success

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SUMMARY:

International rankings show that Switzerland is regularly rated one of the most innovative economies in the world. On the other hand, Switzerland still lacks in innovation in the service sector. This is even more significant, considering that the companies situated in the services sector, represents the largest segment of the Swiss economy.

Different types of service innovation processes are identified: R&D-based, practice-oriented and ad-hoc processes. Considering the methods used in these processes, they may have a stronger focus on service and/or innovation and maybe used with variable frequency. A survey about 300 Swiss companies indicates, that innovative firms from this service sector often use “service-specific innovation processes” and apply this methods more frequently than others. This can increase the market share of innovative service firms and strengthen their competitive position.

Objectives

The following paper discusses in particular the service innovations and investigates the influence of different innovation process types and methods on the number of new and improved services on the one hand, and how to improve the entrepreneurial success measured with sales and profit shares as well as the competitive position on the other.

Prior Work

To design a research model as a framework for the questionnaire, an abstraction of the innovation spinner was developed. In the model three types of innovation processes as independent variables where interrogated: the R&D based, the ad-hoc and the practice-driven processes. With regard to the innovation methods four different types of methods where referred to in the survey (also independent variables): general management methods without any focus on services, service specific methods, and innovation specific methods with and without focus on services. Innovation output (new and improved services) and entrepreneurial success (profit share, sales share and competitive position) where used as dependent variables.

Approach

From a randomized proportional stratified sample with 6000 Swiss service firms results a data record with 300 fully filled questionnaires. Regression analysis is used to test the significance of the whole model and analysis of variance is used to find significant differences between three different types of companies: not innovative companies, innovative companies and very innovative companies.

Results

The regression analysis shows that with regard to the profit share as dependent variables the model is significantly affected by improved services. In contrast, the competition position is influenced by new and improved services. Furthermore, the use of R&D based innovation processes leads to a bigger number of new and improved services.

The t-tests present the following significant results:

- The bigger the company is, the more new and improved services where offered
- Profit and sales share of new and improved services is independent of the company size
- Innovative companies more often use an innovation process
- Innovative companies use more innovation methods
- Very innovative companies more often use innovation specific methods

Implications

The Fraunhofer Institute show in their research that the maturity level of methods used is below 26%. Hence, the development of service and innovation specific methods is a key task for any company and research institutions dealing with service innovation. Knowledge and technology transfer institutions should support SMEs by implementing and formalizing these processes and methods. At last, universities should provide courses or even degree programs with a main focus on service innovation management.

Value

It was shown that innovative service companies use service-specific innovation processes and methods more frequently, which can increase the profit share of innovative services and improve their competitive position.

Keywords: service innovation, processes, methods, entrepreneurial success

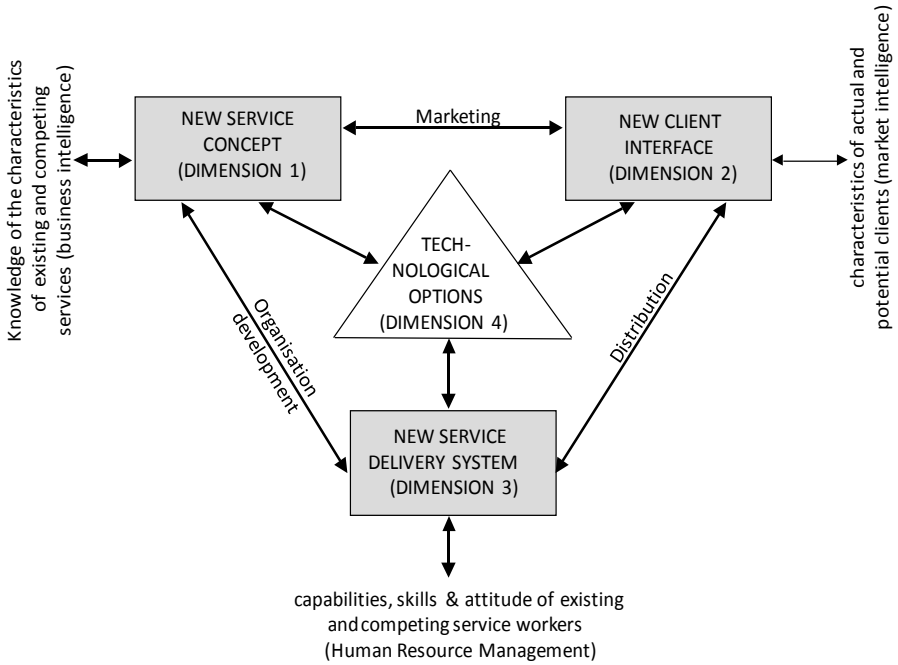
JEL classification: M10; O31;

1. Introduction

The EU-12 countries generate approximately 71% of their gross domestic product through services (Schibany et al., 2007). This is also true for Switzerland, whose tertiary sector generates 72% of the value added. In addition, just under three-quarters of the working population are employed in these industries in Switzerland (Swiss Federal Statistical Office (Bundesamt für Statistik), 2011). However, material goods producers are more frequently engaged in innovation activity than service companies are (Arvanitis et al., 2010, Meiren & Barth, 2002; Ettlie et al. 1984; Gallouj & Savona, 2002; Tombeil et al., 2013). The reason for the low number of innovations in the tertiary sector in comparison with the other sectors lies in the small amount of investment (Amara et al., 2008; cit. Bruhn & Hadwich, 2011). The low degree of public promotion of the innovation activity of service companies is conspicuous (25%), as opposed to the 43% of promoted innovation activity of material goods producers (Schibany et al., 2007). There is also an obstacle to investment in the companies. A reason for this is often the lack of ability to protect patents for services, resulting in the fear of not being able to achieve any sustainable competitive advantage. The options for protecting these innovations are instead the establishment of a strong brand or the creation of confidentiality regulations (Amara et al., 2008; cit. Bruhn & Hadwich, 2011). Despite the obstacles, innovations are of fundamental importance for this sector, since, due to the late diminishing marginal utility, the demand for services continues to grow. Social, demographic, and technological trends too have particularly formed a basis for this positive development. The increase is also a result of the progressive development of the market and of demand behaviour (Meffert & Bruhn, 2006). Analysis within the framework of the Innovation Monitor in the canton of Graubünden in Switzerland has shown that in the industrial sector, service innovations are by now as frequent as traditional product innovation (Ziltener & Forster, 2010). A basic characteristic of services is their immateriality, and also the integration of external factors for their production. In accordance with the "Uno-actu" principle (in a single act), the production and consumption of a service occur at the same time, or the provision of a service is coupled with material goods. A service innovation can then be created, either by changing the process or by generating a new service (Müller-Prothmann & Dörr, 2009). The following definition of a service innovation will be used throughout this paper:

"*A service innovation is a new or considerably changed service concept, client interaction channel, service delivery system or technological concept that individually, but most likely in combination, leads to one or more (re)new(ed) service functions that are new to the market and do require structurally new technological, human or organizational capabilities of the service organization.*" (Van Ark et al. 2003).

We can then distinguish the four dimensions of service innovation represented below:



Four dimensions of service innovation (den Hertog & Bilderbeek 1999)

Service companies seldom have their own research and development departments and, in many cases, innovation management is treated as secondary to the functional tasks (Djellal & Gallouj, 2001). With regard to service innovation processes, three types are distinguished (Gallouj & Savona, 2009; Gadrey et al., 1995; Cooper, 2008; Toivonen & Tuominen, 2009):

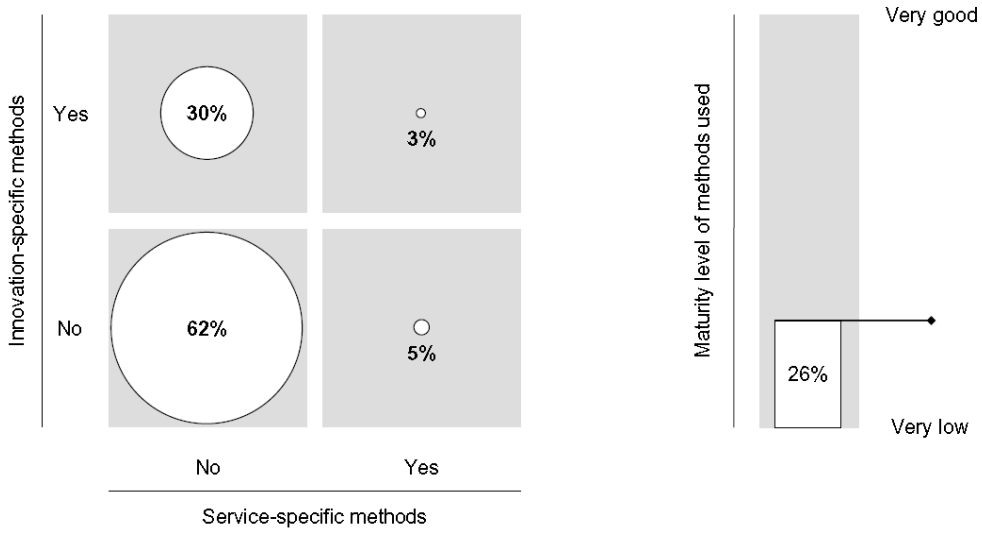
R&D-based process: This is always relevant when service companies transfer the innovation activity to one of their own organisational units. The development and implementation of a prototype takes place outside of the market, and the service innovation is not then marketed in the same way as a new product development until it reaches the maturity phase. As these projects often require substantial resources, top management is generally actively involved.

Ad hoc process: In this innovation process, new ideas are continually developed and implemented directly alongside the provision of services. These projects are accordingly also integrated into the existing organisational structures and processes, and multiple groups of employees and customers participate in their development.

Practice-oriented process: The innovations resulting from this process are not immediately recognised as such. These innovations are manifested retrospectively as customer-specific modification of existing services. They are substantially integrated into the general service portfolio, and are only later marketed as a new service, as a result of further development and standardisation.

Where a service company does decide to be active in the area of innovations, its success is, among other factors, significantly dependant on these innovation development processes. A study by the Fraunhofer Institute (Fähnrich et al., 1999) showed that it is services that have a formalised and documented service development process that predominantly achieve success. By contrast, companies not using this process tend to be less successful. Furthermore, the study showed that the use of methods and tools and the involvement of customers at an early stage in the development process have a positive influence on the success of service companies (Fähnrich et al., 1999). This makes it all the more surprising that only relatively little research has been carried out in the area of service innovation. There is a particular lack of knowledge about how companies with different strategic directions differ from each other in their specific innovation processes (Ettlie et al.,1984).

In the summer of 2011, the Frauenhofer Institute investigated whether service companies from three selected industries (industrial services, information-based services, and health services) use specific methods in their innovation processes, and to what extent these methods have been developed. It is not surprising to find that the methods used are very badly developed.



Classification of service innovation methods (Burger et al., 2011)

As a criticism of this study, it must be noted that it does not provide information about which methods fall under which categories. This would be entirely relevant, as isolated methods can be assigned to different categories. In addition, the four categories of method are not clearly defined. Separation into the four method categories is maintained throughout this paper. As it is not always possible to make a strong distinction between the categories or precisely assign the individual methods to the method categories, the following explains how the four method categories are defined.

Business economics methods

Business economics methods should form a basis for decision-making. They help companies to analyse actual conditions and form possible prognoses for the future (Weber et al., 2008). The methods in this category are specifically tailored to the industry and do not count among either the service-specific or the innovation-specific methods (Burger et al., 2011). These methods usually contribute indirectly in a supportive way to the structuring of the service and are used within the framework of the general management of the company. Examples of such methods would be SWOT analysis, financial calculations, competition analyses, etc. (Opitz, 2008). Business economics methods are used particularly frequently in the phases of generation and evaluation of ideas, and requirements acceptance (Fähnrich, 1999).

Service-specific methods

Service-specific tools are methods that have been designed especially for services and pay particular attention to the roles taken on by the customers and employees during the service (Burger et al., 2011). Process models are frequently used here, since services exhibit a specific chronology (Opitz, 2008). Examples of service-specific methods are complaint management, customer events, and customer and employee surveys.

Service-specific tools are still very rarely used by companies and, moreover, are often unfamiliar to companies (Bullinger & van Husen, 2006). The study by Burger et al. (2011) supports this statement. Only 8% of the methods described by experts and practitioners were assigned to the service-specific methods category.

Innovation-specific methods without focus on services

Innovation-specific methods are methods that focus on product invention and product improvement. However, not all methods that are used in the innovation process are innovation-specific. Business economics methods (such as market analyses and break-even calculations) lay the foundation for the development of new products in the innovation process. Innovation-specific methods are those that are used for the generation, selection, and implementation of new solutions to problems. They attempt to break existing patterns of thinking in companies in order to find creative new solutions (Gassmann & Sutter, 2008). Examples here would be creativity methods, innovation portfolios, Quality Function Deployment (QFD), and Failure Modes & Effects Analysis (FMEA). Knowledge levels and the degree of application of innovation-specific methods are also low in SMEs (Vorbach & Perl, 2007; Lewrick & Ziltener, 2011). This statement is again supported by Burger et al. (2011). Only 33% of the methods specified which were designated as suitable for the development of services by surveyed experts and practitioners were identified as innovation-specific methods.

Innovation-specific methods with focus on services

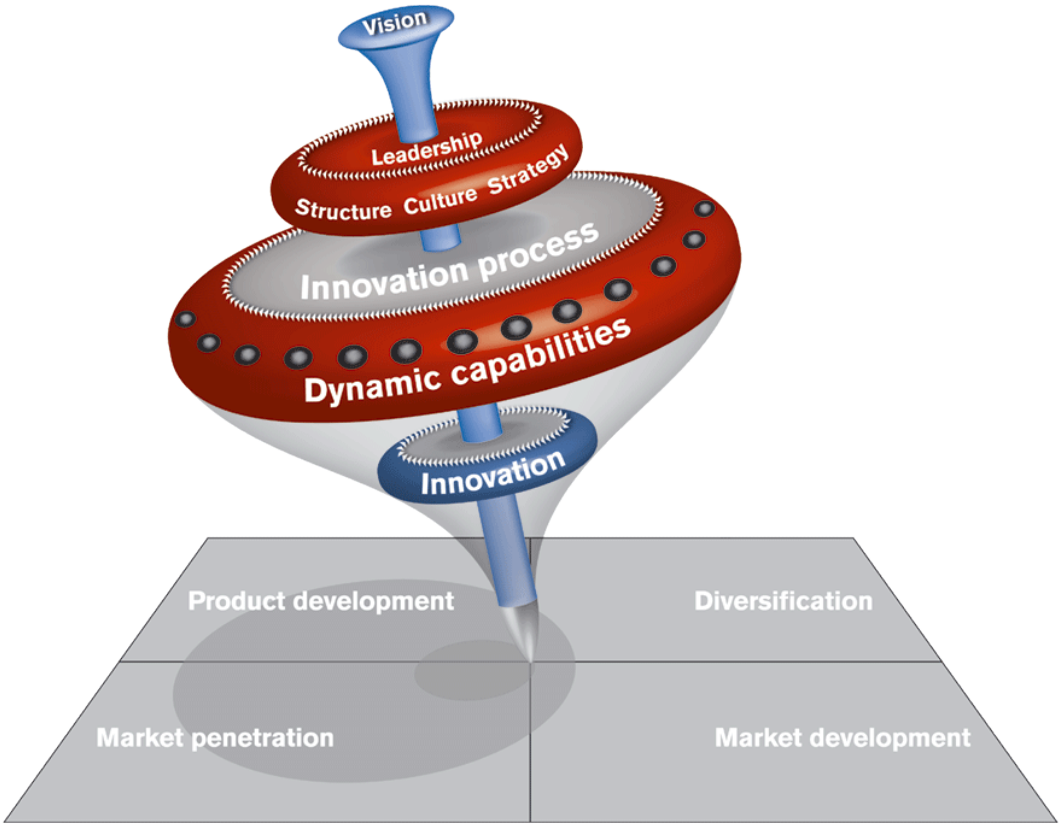
Innovation-specific methods with a focus on services are understood to be the methods that have the objective of developing or improving services. They are used for the generation, selection, and implementation of new solutions to problems, and have either been created purely for the service sector or specifically adapted for it. They are characterised particularly by their focus on the cooperation between customers and employees (Burger et al., 2011) or on the process of interaction (Opitz, 2008). Typical examples here are the service blueprint, SERVQUAL, or the Kano method. According to the study carried out by Burger et al. (2011), however, these make up only 3% of the existing methods. Here in particular, there is a greater need for action in the development of new methods (Burger et al., 2011).

2. Research model

The research model used in this study is based on the integrated innovation management model of the innovation spinner (Forster & Ziltener, 2010). The innovation spinner was developed to analyse the innovative capacity and willingness to innovate of an enterprise, and to describe innovation management as an integrated component of company management. The company-specific situation can also be represented using the model, and a comparison drawn with competitors in the industry. This section introduces the innovation spinner with the most important analysis dimensions and its functions. The model is based on the following definition of innovation:

"Based on a holistic understanding, innovation is the implementation of an idea that is new to the company in relation to products, services, manufacturing processes, forms of organisation, or a combination of these, which aims to gain market advantages and therefore to ensure the economic success of the company" (Kirner et al. 2006).
This comprehensive view allows the inclusion of the entire spectrum of innovation activities at an operational level (cf. Sommerlatte 2008):

- new or improved products
- new or improved services
- technical processes by which a product can be produced more cheaply, with higher quality, more safely, or faster (material and immaterial)
- organisational structures (structure and process optimisation) e.g. the introduction of "continuous improvement processes" (CIPs), Kaizen, segmentation of production based on customers or products, new sales channels, customer acquisition and retention processes, or brand management



Innovation spinner (Forster & Ziltener, 2010)

Considered scientifically, the innovation spinner starts as a "Black Box" (Van Someren, 2005; Billerbeck, 2003). Innovation is far more than a straightforward input-output relationship; rather today, it is understood to be a fluid process (Dodgson et al., 2005) with feedback. This means

(A) a feedback-oriented innovation and production process, from the idea through to the marketing of a service (Bessant & Tidd, 2007; Dodgson et al., 2005), and

(B) the result from the transformation potential or learning potential of an organisation in the dynamic market environment (Hungenberg, 2009; Krüger, 2009).

From a scientific/theoretical view, the "capability-based view" (Teece, Pisano & Shuen, 1997; Eisenhardt & Martin, 2000) is provided as an investigative and explanatory framework for the innovation spinner. The route to a superior and sustainable competitive advantage is via special capabilities that play a particular role in dynamic markets: advantages in efficiency and effectiveness, exclusive access to capital, or specially qualified staff. From a global point of view, it is a question of capacity for continuous change; the capability to constantly learn new routines or adapt existing ones (Eisenhardt & Martin 2000 cit. in Bernhardt, 2009).

These "dynamic capabilities" (Teece et al., 1997) are defined as "[…] the firms processes that use resources – specifically the processes to integrate, reconfigure, gain and release resources – to match and even create market change". Hence, the entrepreneurial organisational framework and scope of action can be linked to organisational and strategic routines, "[…] by which firms achieve new resource configurations as markets emerge, collide, split, evolve, and die" (Teece et al. 1997, 516; Eisenhardt und Martin 2000, 1107).

According to Teece et al. (1997), the core task of innovative company management is to be capable of meeting the requirements of the dynamic environment. A bundle of simple routines, skills, and resources – termed the core competencies – is necessary for this. These are difficult for competitors to imitate. Innovation-oriented management is required particularly for clever tactical manoeuvring through the minefield of operative "excellence" and strategic effectiveness. It must always be that bit more effective than the competition, must recognise new potential for success early, and exploit it (Lombriser & Abplanalp, 2010). The tasks set for innovation management, therefore, are to gather, coordinate, integrate, and reconfigure organisational knowledge, resources, and functional competencies in a targeted way, internally and externally.

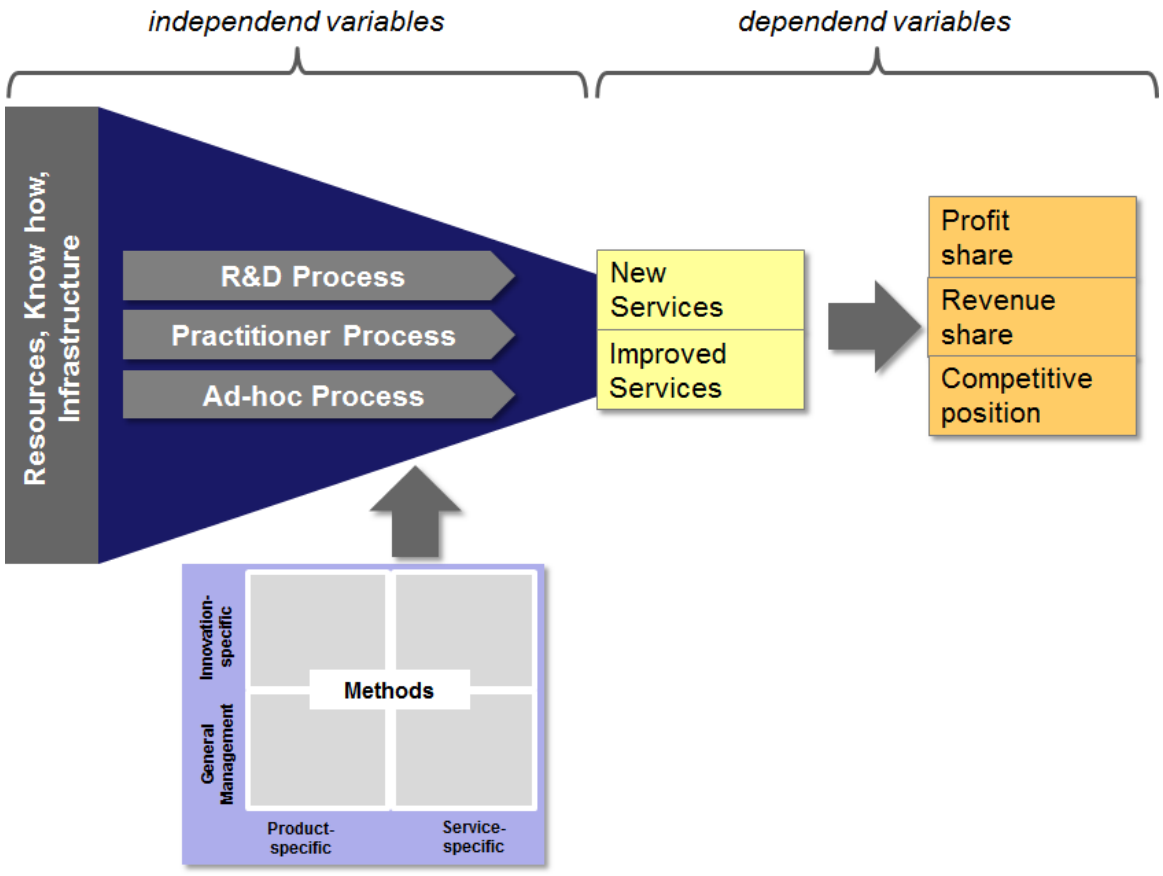
The innovation process is at the heart of innovation-oriented thinking and action: it includes generating new ideas, selecting good ideas, and implementing those (Bessant & Tidd, 2007). When implementing this core process, it must be designed with foresight (Hauschildt, 2004), optimally equipped with resources, and finally, be managed with routines. Success hinges on the extent of the "fit" between an innovation strategy supported by norms and the management, the organisational structure, and the culture.

Success in innovation is the most important target and monitoring figure in the innovation spinner. In the model, this is recorded in two characteristics; firstly, how efficiently the innovation-related activities are carried out and resources are utilised in the business (innovation output), and secondly, how effectively the interaction of innovation management and dynamic capabilities influences the situation of the company in the market (innovation effect). This understanding is based on the theoretical construct of "ambidexterity" (March, 1991).

This capability must be ranked as a "high-order capability" (Güttel, 2009) of dynamic company management and corresponds with the "AND" mindset (Ziltener et al., 2012). This means that companies with a high degree of innovation routine (exploitation) and, simultaneously, the capability to change (exploration), balanced appropriately according to the situation, are simply more profitable than competitors who place less emphasis on these dimensions (see Uotila et al., 2009)[1].

[1]The balance of exploitation and exploration activities with regard to above-average financial performance of around 200 S&P companies were examined. This showed that optimal balance requires trade-off decisions and is heavily influenced by environmental conditions.

Based on a model such as that used by UBS (2005), an abstraction of the innovation spinner model was produced with limiting of the innovation processes. Thus we developed a model that allows quantitative operationalisation of the elements. The data should be kept numeric whenever possible, with a view to a possible regression analysis.



Research model (Suss & Ziltener, 2012)

3. Research questions

Against this background, the following research questions can be formulated:

1. With regard to the innovation output (the number of new and improved service innovations) and the innovation effect (sales share and profit share, competitive position), which processes, methods and input factors have a significant influence, and what differences are due to the size of the companies?

2. What differences exist between competitive and non-competitive companies with regard to the number of innovations and the frequency of use of processes and methods?

3. What differences exist between innovative and non-innovative service companies with regard to the frequency of use of processes and methods and its formalisation?

4. Methodology

To answer the questions posed, primary data was collected via an online questionnaire. The evaluation is based on 300 companies in total. To emphasise the validity of the procedure, this section will describe in detail the sample design, the data collection and the data analysis for this quantitative survey.

Sample design

The results are based on a quantitative survey of companies in the service sector. The company and business register of Switzerland is used as the framework for the sample. In order to avoid language barriers, only companies established in German-speaking Switzerland are taken into consideration. This involves the following cantons: Zurich, Bern, Lucerne, Uri, Schwyz, Obwalden, Nidwalden, Glarus, Zug, Fribourg, Solothurn, Basel-Stadt, Basel-Landschaft, Schaffhausen, Appenzell Ausserrhoden, Appenzell Innerrhoden, St. Gallen, Graubünden, Aargau, Thurgau, and Valais (BAMAT Consulting AG, 2011). According to the Swiss Federal Statistical Office (2011), there were a total of 176,473 companies in these regions in 2008. The classification of services is also very important for the sample selection. In order to facilitate a systematic approach, we follow the NOGA (Nomenclature Générale des Activités économiques) General Classification of Economic Activities from the Swiss Federal Statistical Office when classifying the services. Of the 21 categories, all industries are considered apart from category A "Agriculture, forestry and fishing" and category C "Manufacturing industry/manufacture of goods". The other 19 categories were bracketed into 8 groups as follows: 1) Infrastructure, 2) Financial sector, 3) Public service, 4) Knowledge Intensive Business Services (KIBS), 5) Trade, repairs, and warehousing 6) Tourism, 7) Communication, and 8) Private and other services. Category numbers 1-6 were taken into consideration for the planned project. The "Private and other services" and "Communication" categories were not taken into account, as, according to a study by the State Secretariat for Economic Affairs (SECO), these industries have the lowest proportion of companies who launch market innovations (Arvanitis et al., 2010).

A proportional stratified random sample of the industries was then considered as a selection procedure. The advantage of a sample generated in this way is that more precise statements can be made about the service industry population. In this case, however, this sample also resulted in a significant disadvantage for the individual categories. As some industry categories in the service sector represent only 5% of the sector, with a response rate of 5%, there would be only 15 data sets received from these industry categories. This number of data sets would not be sufficient to make a precise statistical analysis of the individual categories, however, and for that reason, a proportional stratified random sample was not used. An industry-specific uniformly-distributed stratified random sample was used instead. This allows calculations with the same precision per stratum (Polasek, 1997). Based on these considerations, 1,000 companies from each included industry category were approached.

The following table shows the exact distribution of the participating companies:

Industries	NOGA Sections	Distribution of companies to which requests were sent
Tourism	I,R, H 49-51; section I: sections R & H:	334 companies 333 companies each 1,000 companies in total
KIBS	M, N per section	500 companies 1,000 companies in total
Trade, repairs and warehousing	G, H section G: section H:	750 companies 250 companies 1,000 companies in total
Infrastructure	B, D, E, F, L	200 companies per section 1,000 companies in total
Public service	O, P, Q, U	250 companies per section 1,000 companies in total
Financial sector	K	1,000 in total

A proportional stratified random sample was nevertheless taken in relation to company size. It must be noted here that categorisation is not by company size, so the disadvantages of a stratified random sample that were mentioned are therefore not relevant.

The percentage distribution of the companies approached is as follows:

24% micro-companies (1-9 employees)

50% small companies (10-49 employees)

25% medium companies (50-249 employees)

1% large companies (250 or more employees).

The distribution does not correspond exactly to the population of company sizes in the economy. Considerably more micro-companies would have to be surveyed for this. Accordingly, we later investigate the influence that company size has on innovation success. The 6,000 companies were selected at random, and the selection was compiled by the Federal Statistical Office.

Data collection

Based on the innovation spinner model (Forster & Ziltener, 2011), the elements of the empirical research model (Suss & Ziltener, 2012) were operationalised and an online questionnaire was generated using the Internet-aided survey tool (EFS Survey). From the total of 6,000 service companies that received an invitation to take part in the online survey, 320 companies filled out the questionnaire. The response rate was therefore approximately 5%. After adjusting the data, a database of 300 companies is used. At this point, it should be noted that these 300 hundred companies already belong to the group of more or less innovative Swiss companies. The very fact these companies answered the questionnaire shows an affinity to the topic of service innovation. Therefore, we should consider this when interpreting the results.

Data analysis procedure

Before the data analysis, the data set was checked for incorrect data or outliers and these were excluded from the data set. Finally, the data set was analysed using the statistical program SPSS. The selection of the statistical test depends on the level of measurement (nominal, metric, ordinal), the distribution of the variables, and the objective of the test (Field, 2005). The general analyses used in this work were regression analysis, the chi-square test, the Kruskal-Wallis test, and Spearman's rank correlation coefficient. The measure of association coefficient C was also calculated.

5. Results

Linear regression analysis shows that innovative service firms invest money and personnel into the development of service innovations and use at least one of the three innovation processes. Also, to have a quite filled innovation funnel is crucial for new and improved services. Figuratively, there ain't no such thing as a free lunch!

Table 1: Regression Analyses with Innovation Output as Dependent Variable

	New Services	***Improved Services***
Input factors		
Labor Costs for Innovation Activities	0.018 **	0.011
IT Costs	0.000	0.000
Infrastructure Costs	0.000	0.000
Involved Employees in %	0.004	0.013 *
Innovation Pipeline		
... in the Pipeline?	0.028	0.155 **
... Work in Progress	0.160 ***	0.782 ***
Innovation Processes		
R&D based Process in %	0.019 ***	0.014
Ad-Hoc Process in %	-0.009 **	-0.014 *
Practitioner Process in %	0.006 *	0.012 *
Methods		
General Management Methods	0.004	0.004
Service-specific Methods	-0.005	-0.003
Innovation-specific Methods without Focus on Services	-0.007	0.014
Innovation-specific Methods with Focus on Services	0.000	-0.013
Frequency Genereal Management	-0.128	-0.470
Frequency Service-specific	-0.040	-0.008
Frequency Innovation-specific	0.453 **	-0.482
Frequency Innovation- and Service-specific	0.005	0.328
Control variables		
Industry	-0.034	0.048
Number of Employees	0.186 ***	0.398 ***
N = 298	F=7.365	F=10.854
*** p < 0.001	R^2 (corr.) = .289	R^2 (corr.) = .387
** p < 0.05		
* p < 0.1		

The second regression analysis shows that sales and profit share is significantly influenced by per cent of involved employees. The use of a R&D based innovation process increase the revenue share of new and improved services, and in addition, the use of specific methods has an influence on sales and profit.

Table 2: Regression Analyses with Revenue and Profit Share as Dependent Variable

	Revenue Share		Profit Share	
	of New Services	*of Improved Services*	*of New Services*	*of Improved Services*
Input factors				
Labor Costs for Innovation Activities	-0.064	0.035	-0.013	0.080
IT Costs	0.000	-0.007	-0.001	-0.007
Infrastructure Costs	0.000	0.005	0.000	0.006
Involved Employees in %	0.204 ***	0.364 ***	0.266 ***	0.370 ***
Innovation Pipeline				
... in the Pipeline?	-0.117	-0.055	-0.219	0.225
... Work in Progress	0.715	0.046	0.325	-0.721
Innovation Processes				
R&D based Process in %	0.132 **	-0.209 **	0.002	-0.185
Ad-Hoc Process in %	0.015	0.194 **	0.005	0.067
Practitioner Process in %	0.065	0.016	0.113	0.062
Methods				
General Management Methods	-0.112	-0.131	-0.099	-0.229 **
Service-specific Methods	0.054	-0.146	0.152	-0.143
Innovation-specific Methods without Focus on Services	-0.002	0.132	-0.019	0.083
Innovation-specific Methods with Focus on Services	-0.290 **	0.310	-0.376 *	0.458 **
Frequency Genereal Management	1.206	4.158	1.429	4.471
Frequency Service-specific	0.513	1.162	-0.153	4.747
Frequency Innovation-specific	0.065	-1.692	1.835	-0.168
Frequency Innovation- and Service-specific	1.785	-8.413 **	-0.559	-14.102 ***
Control variables				
Industry	0.299	-1.768	0.765	-1.215
Number of Employees	-0.716	1.277	-0.321	0.980
N = 298	F=2.443	F=3.071	F=1.969	F=3.148
*** p < 0.001	R^2	R^2(corr.)=.235	R^2(corr.)=.137	R^2(corr.)=.259
** p < 0.05				
* p < 0.1				

Also, the number of new services has a significant influence on revenue share and on profit share. Means, innovative companies are able to penetrate their innovations to the market.

Table 3: Regression Analyses with Revenue and Profit Share as Dependent Variable

		Revenue Share
	of New Services	***of Improved Services***
New Services	3.202 **	-3.537 **
Improved Services	-.803	4.360 ***
*** p < 0.001	N=125	N=130
** p < 0.05	F=6.233	F=11.363
* p < 0.1	R^2 (corr.)=.078	R^2 (corr.)=.138

		Profit Share
	of New Services	***of Improved Services***
New Services	3.011 **	-2.93 *
Improved Services	-0.807	3.615 **
*** p < 0.001	N=118	N=119
** p < 0.05	F=2.610	F=5.398
* p < 0.1	R^2 (corr.)=.027	R^2 (corr.)=.069

In a further step, several Analysis of Variance with Bonferroni correction (p=0.05) were carried out.

Firstly, the company size was specified as a group variable (Mikro = 9 employees, Small = 10 – 49 employees, Middle = 50 – 249 employees, and big = > 250 employees). This gave the following results:

- The larger a company is, the more new and improved services are offered on the market
- Profit and revenue shares for the new and improved service innovations as well as the competitive position, however, are *not* dependent on the company size.

This finding shows that the size of the company alone does not decide whether an innovative service company is successful or not.

Table 4: ANOVA between four Groups of Company Size

		Company Size	
		Sum of Squares	F
Innovation Output			
New Services	between groups	117.030	14.208 ***
	within groups	812.716	
	cumulative	929.747	
Improved Services	between groups	428.744	9.844 ***
	within groups	4297.453	
	cumulative	4726.197	
Entrepreneurial Success			
Revenue Share New Services	between groups	828.752	1.305
	within groups	25616.400	
	cumulative	26445.152	
Revenue Share Improved Services	between groups	639.203	.439
	within groups	61176.828	
	cumulative	61816.031	
Profit Share New Services	between groups	680.554	.564
	within groups	45838.700	
	cumulative	46519.254	
Profit Share Improved Services	between groups	189.722	.117
	within groups	61976.320	
	cumulative	62166.042	
Competitive Position improved	between groups	.636	.859
	within groups	73.031	
	cumulative	73.667	
N = 298	Groups:	Micro	1 - 9
*** p < 0.001		Small	10 - 49
** p < 0.05		Medium	50 - 249
* p < 0.1		Big	> 250

In a second test, three groups of innovation types were formed.
Type 0: Has marketed *no* new or improved services in the last three years
Type 1: Has marketed *one* new or improved service in the last three years
Type 2: Has marketed *multiple* new or improved services in the last three years

Table 5: ANOVA between three Groups of Innovators

		Type of Innovators	
		Sum of Square	F
R&D based Process in %	between groups	3096.94	4.087 **
	within groups	112519.31	
	cumulative	115616.25	
Ad-Hoc Process in %	between groups	13047.846	10.461 ***
	within groups	185228.701	
	cumulative	198276.547	
Practitioner Process in %	between groups	22372.882	15.177 ***
	within groups	218901.715	
	cumulative	241274.597	
Degree of Formalization	between groups	24.282	14.444 ***
	within groups	165.865	
	cumulative	190.147	
General Management Meth	between groups	11008.695	7.269 ***
	within groups	224902.692	
	cumulative	235911.387	
Service-specific Methods	between groups	7671.907	7.164 ***
	within groups	159020.13	
	cumulative	166692.037	
Innovation-specific Methods without Focus on Services	between groups	3048.39	4.879 **
	within groups	92790.957	
	cumulative	95839.347	
Innovation-specific Methods with Focus on Services	between groups	1492.593	2.126
	within groups	104267.044	
	cumulative	105759.637	
Frequency Genereal Manag General Management Meth	between groups	32.378	17.159 ***
	within groups	280.218	
	cumulative	312.597	
Frequency Service-specific Services-specific Methods	between groups	26.717	15.095 ***
	within groups	262.83	
	cumulative	289.547	
Frequency Innovation-spec Innovation-specific Metho	between groups	10.91	9.307 ***
	within groups	174.076	
	cumulative	184.987	
Frequency Innovation- and and Service-specific Metho	between groups	10.291	6.203 **
	within groups	246.376	
	cumulative	256.667	
N = 300	Groups:	no service innovation	
*** p < 0.001		one service inn 10 - 49	
** p < 0.05		several service 50 - 249	
* p < 0.1			

This ANOVA showed that

- innovative service companies (types 1 and 2) use innovation processes (all types) more frequently and use service-specific and innovation-specific methods in their processes with a significantly greater frequency
- very innovative service companies (type 2), in comparison with non-innovative companies, use a significantly greater percentage of methods in their processes, and also use these methods with a significantly greater frequency

Finally, it showed that companies with a higher degree of formalisation in their innovation processes have market new and improved services more frequently during the past three years.

In a third ANOVA, the competitive position (weakened, maintained, or strengthened) was defined as a group variable.
The Analysis showed that the better the competitive position is the more these companies innovate in new and improved services.

Table 6: *ANOVA between different Competitive Positions*

		Competitive Postion	
		Sum of Squares	F
Innovation Output			
New Services	between groups	33.043	5.472 **
	within groups	896.703	
	cumulative	929.747	
Improved Services	between groups	220.105	7.254 ***
	within groups	4506.092	
	cumulative	4726.197	
N = 300	Groups:	weakened	
*** p < 0.001		maintained	
** p < 0.05		improved	
* p < 0.1			

The following results were produced for service companies which improved their competitive position within the last three years in comparison to all others:

- They more frequently use an R&D-based and/or a practice-oriented innovation process.
- They use a significantly greater percentage of general business economics methods, and of service-specific and innovation-specific methods. Also, they use significantly more often all types of methods.

Table 7: ANOVA between Competitive and not Competitive Companies

		Position Improved	
		Sum of Squares	F
Input Factors			
Involved Employees in %	between groups	437.217	0.537
	within groups	242550.570	
	cumulative	242987.787	
Labor Costs for Innovation Activities	between groups	84.006	0.298
	within groups	83956.661	
	cumulative	84040.667	
IT Costs	between groups	7392570.261	1.187
	within groups	1855387798.576	
	cumulative	1862780368.837	
Infrastructure Costs	between groups	5822452.509	2.869 *
	within groups	604829896.571	
	cumulative	610652349.080	
Innovation Pipeline			
... Work in Progress	between groups	20.749	3.700 *
	within groups	1660.063	
	cumulative	1680.812	
... in the Pipeline?	between groups	15.814	0.994
	within groups	4707.162	
	cumulative	4722.975	
Innovation Processes			
R&D based Process in %	between groups	3292.619	8.735 **
	within groups	112323.631	
	cumulative	115616.250	
Ad-Hoc Process in %	between groups	259.516	0.391
	within groups	198017.031	
	cumulative	198276.547	
Practitioner Process in %	between groups	9155.079	11.753 ***
	within groups	232119.517	
	cumulative	241274.597	
General Management Methods	between groups	3883.471	4.988 **
	within groups	232027.916	
	cumulative	235911.387	
Service-specific Methods	between groups	236.405	0.423
	within groups	166455.631	
	cumulative	166692.037	
Innovation-specific Methods without Focus on Services	between groups	21.647	0.067
	within groups	95817.700	
	cumulative	95839.347	
Innovation-specific Methods with Focus on Services	between groups	1290.814	3.682 *
	within groups	104468.822	
	cumulative	105759.637	
Frequency Genereal Management	between groups	10.974	10.843 ***
	within groups	301.622	
	cumulative	312.597	
Frequency Service-specific	between groups	7.646	8.083 **
	within groups	281.900	
	cumulative	289.547	
Frequency Innovation-specific	between groups	3.000	4.913 **
	within groups	181.986	
	cumulative	184.987	
Frequency Innovation- and Service-specific	between groups	6.771	8.074 **
	within groups	249.896	
	cumulative	256.667	
N = 298	Groups:	...improved	yes
*** p < 0.001		...improved	no
** p < 0.05			
* p < 0.1			

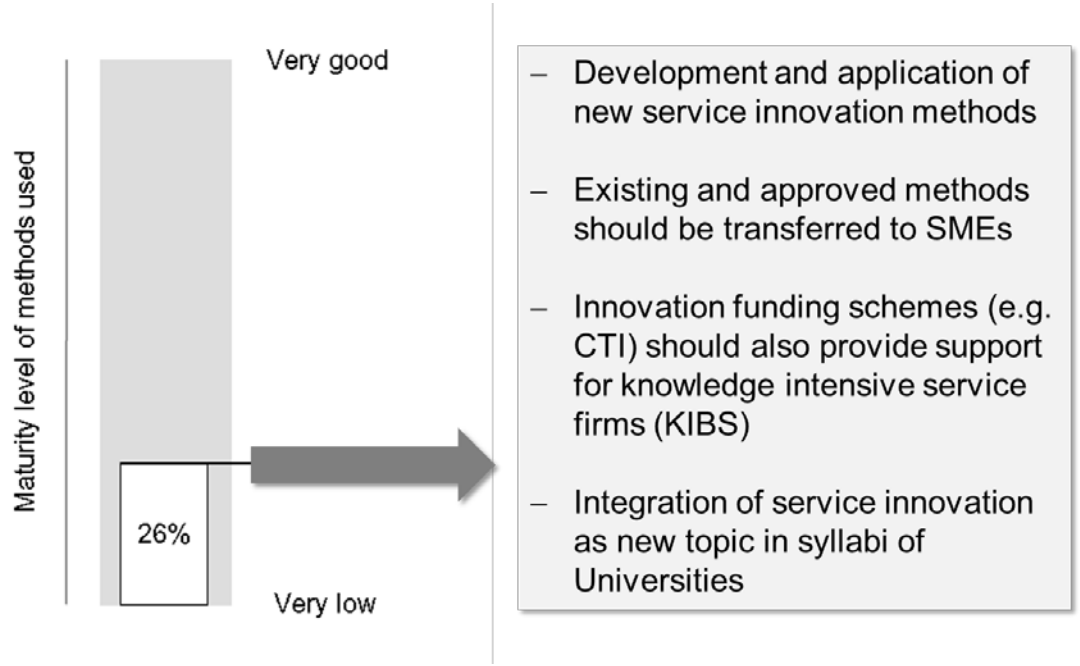
6. Implications

Not only this study, but also widely spread literature verified that using a systematic innovation process increases the probability of successful implementation of Innovation (Verloop, 2004; Thrane et al., 2010; Hausschildt & Salomo, 2010; Mensel, 2004; Cooper & Kleinschmidt, 1987; Cooper, 2001). There is still a broadly discussed awareness about missing knowledge of how to systematise service innovation processes with its unique methods (Meiren & Barth, 2002; Ettlie et al., 1984; Gallouj & Savona, 2009; Tombeil et al. 2013).

This paper underlines empirical indications, that (at least the participating) innovative service companies use a systematic innovation process. Hence, business owners of and managers in service firms should consider these findings and begin to implement systematic service engineering processes with adequate methods. Each step into this direction helps those companies to launch the innovation spinner. As long as the decision-makers in the companies allow learning from this process (e.g. fault tolerance), the companies can increase the innovation routines and become innovative service firms.

The researches of Burger et al. (2011 by Frauenhofer Institute) show that the degree of maturity of innovation-specific and service-specific methods throughout the companies surveyed was only 26% (see figure below). The development and application of new methods, which are suitable for practical use is therefore a key task for many knowledge-based service companies, as well as for institutes charged with researching this subject.

Since many SMEs still have little experience with standardised innovation processes and methods, the knowledge and technology transfer institutions should additionally provide support for the knowledge-based service companies. Universities and universities of applied sciences are invited to add the subject of service innovation to their syllabi and to the contents of their courses.



Maturity level of methods used (Burger et al., 2011) and possibilities of response

7. Outlook

So, what we are going to do in our next steps?

First, we have to develop new service innovation methods with a qualitative approach, and second, our institute aim to establish a service development lab at our university and therefore we have several future research questions:

Qualitative access to “service innovation methods”

- Which new methods will be appropriate for the three different types of innovation processes?
- What service innovation methods used in not service-specific industries are adoptable to service industries?
- What kind of qualification would be the best to foster the use of service innovation processes and methods in Swiss service firms?
- With regard to very innovative players within different service industries, what is the contribution to entrepreneurial success by using existing, adopted or new methods?

Quantitative access to the establishment of a “service development lab” at our university of applied sciences

- What are the most urgent needs in the service industries with regard to service innovation processes and methods?
- What kind of services should be provided and which technologies should be available (e.g. Service Laboratories)?

Annex - Questionnaire

Questionnaire	
General information	
Q.1.0.	**Please enter the code that appears on the right-hand side above your address on the postcard.** _____
	This questionnaire contains questions about service innovation. This is defined as follows: A **service innovation** is - the development and launch of a new service concept - a new type of customer contact - a new type of sales channel - a new internal, organisational, or technological design that influences the service system of the company The term "**new**" means that the service did not previously exist in the market. The term "**improved**" means that although the service previously existed in the market, it shows clear performance advantages in comparison with predecessors.

Q.1.1.	**How many new and improved services have you launched on the market in the last three years?** New services: _____ Improved services: _____
Q.1.2.	**What are the sales share and profit share (%) for new and improved services in the last three years?** Sales share / Profit share New services _____% _____% Improved services _____% _____%
Q.1.3.	**Within the last 3 years, compared with your most important competitors, has your company's competitive position (relative market share)..** O strengthened O maintained O weakened

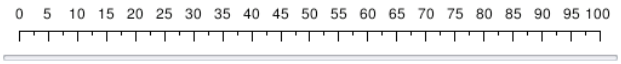
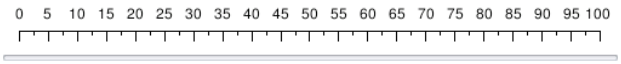
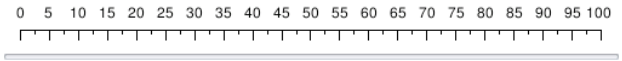
Q.1.4	**How many innovative and/or improved ideas do you currently have...** …in the pipeline? _____ …in process? _____
Q.1.5.	**What degree of formalisation do you have in your service innovation process?** ○ No formalisation ○ Formalised to a small extent ○ Formalised, but not documented ○ Formalised and documented

Innovation process	
	In the following questions, a distinction is made between three innovation processes: **Research and development process:** The new service is developed, tested, and then sold as a new service product, independently of the day-to-day business. **Ad hoc process:** The innovation is created directly in day-to-day business at the time that the service is provided, often together with the customer. **Practice-driven process:** A new service product is bundled and marketed from a collection of service projects that have already been provided.
Q.2.0.	**Do you use the following three innovation processes in your company?** Research and development-driven process ○ Yes ○ No Ad hoc process ○ Yes ○ No Practice-driven process ○ Yes ○ No
Q.2.1.	**If yes, to what degree (%) do you use these three innovation processes in your company?** Please split the total of exactly 100% between the processes you use. Research and development-driven process _____% Ad hoc process _____% Practice-driven process _____%

Methods	
	In the following questions, a distinction is made between four types of methods: **Business economics methods:** All methods that are used in the framework of the general management of the company (e.g. SWOT analysis, risk management, market analysis, investment appraisals, change management, balance scorecard, etc.) **Innovation-specific methods without focus on services:** Methods that are used for the generation, selection, and implementation of new solutions to problems (e.g. creativity methods, pilot projects, FMEA, concept tests, innovation scorecard, trend analyses, etc.) **Service-specific methods:** Methods that are principally used in the service industry (e.g. customer events, consumer research, complaint management, frontline employee surveys, Internet customer-to-customer communication analysis, etc.) **Innovation-specific methods with focus on services:** Service-specific methods that are used for the generation, selection, and implementation of new solutions to problems (e.g. purchasing simulation, service blueprinting, customer workshops, gap analysis/SERVQUAL, evaluation of customer queries, Kano method, etc.)

Q.3.0.	**Do you use the four types of methods described above in the innovation process?** **Business economics methods** ○ Yes ○ No **Service-specific methods** ○ Yes ○ No **Innovation-specific methods without focus on services** ○ Yes ○ No **Innovation-specific methods with focus on services** ○ Yes ○ No
Q.3.1.	**If yes, to what degree (%) do you use these types of methods in the innovation process?** Please split the total of exactly 100% between the processes you use. Business economics methods _____% Service-specific methods _____% Innovation-specific methods without focus on services _____% Innovation-specific methods with focus on services _____%

Q.3.2.	**How often do you use these methods during the innovation process?** **Business economics methods** ○ Never ○ Rarely ○ Often ○ Very often **Service-specific methods** ○ Never ○ Rarely ○ Often ○ Very often **Innovation-specific methods without focus on services** ○ Never ○ Rarely ○ Often ○ Very often **Innovation-specific methods with focus on services:** ○ Never ○ Rarely ○ Often ○ Very often

Q.3.3	**On a scale of 0 to 100, how well-developed are the methods currently available in your company?** 0 – very poorly developed ; 100 – completely developed **Business economics methods**  **Service-specific methods**  **Innovation-specific methods without focus on services**  **Innovation-specific methods with focus on services** 
Q.3.4.	**How many methods do you use on average in your innovation process?** _____

Input factors	
Q.4.0.	**What percentage of your workforce (including managing director and owner) on average is actively involved in the implementation of innovation?** _____%
Q.4.1.	**What is the ratio of staff expenditure in relation to innovation activities and day-to-day business?** Specify a percentage (an estimate is sufficient). Staff expenditure for innovation activities: _____%
Q.4.2.	**What is the average percentage of your total costs resulting from the innovation process?** Information technology costs (hardware, software, Internet, telephone, etc.): _____% Infrastructure costs (premises, materials, technology): _____%
Completion	
Q.5.0.	**We would be delighted to send you the results of this study by e-mail. If you are interested in receiving them, please enter you email address:** _____

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