

Service Innovation Process Digitization: Areas for exploitation and exploration

Abstract

Purpose The purpose of this paper was to review the dominant role which technology plays in the New Service Development (NSD) process and indicate the critical success factors should managers have in mind during the implementation of service projects as well as the extent to which NSD lead to technological investments.

Methodology Studies were identified using a three-phased literature review methodology, which was suggested by Webster and Watson (2002). 144 papers have been categorized and analyzed based on their content.

Findings The findings of this paper indicate that IT is a critical factor for the success of new services but managers ignore its benefits. It could be used during the development process in order to support managers to produce innovative services.

Practical implications This study provides practical implications for IT managers in order to increase the success rate of service innovation. The understanding of the effect of technology on firm performance can help managers to use technology in order to increase firm performance and provide an opportunity for organizations to benchmark their own processes of service innovation technology with their competitors.

Originality/value This paper may be of interest to academics who are already studying service innovation or NSD-related scientific areas, or researchers who have been introduced to the field but they are interested in examining more specific insights into where current research topics in this literature can be located, and how they may contribute to them.

Keywords New Service Development; Service Innovation; Information Technology; Digital services; Critical Success Factors

Introduction

Over the last decade, transformational developments in Information Technology (IT) have increased opportunities for service innovation reconsidering what service means and thus how service innovation may develop. Innovation is a pillar of the economic performance of firms. Digital revolution has changed businesses in the service sector that adopt innovation in the service development process. If nonetheless many firms do not support innovation, this is due to many uncertainties involved (Ip *et al.*, 2011). Against this background, the traditional approach of service innovation has been increasingly challenged due to the underestimation of the dynamics of the service sector was seen as incompatible with the economic growth (Barrett *et al.*, 2015; Grisseemann *et al.*, 2013). The intangible nature of services, the increase of digital technologies, and competition in the market lead firms to develop customized solutions. In a digital society which offers services to the customers, firms require knowing their digital customers, understanding their needs in order to develop innovative services (Frank *et al.*, 2019).

In this view, researchers need to systematically evaluate factors decisive for success and failure of innovation. IT has been acknowledged as a significant factor for service innovation and development, and both academics and managers have realized the importance of IT in effective

innovation activities. In practice, there is a wide range of relationships between technology and innovation in services (Law *et al.*, 2009). Examples of innovation networks including technological components contain gathering information on competitors' services, tracking and tracing systems, developing client interface or delivery system, enabling transport service providers to monitor the progress of their fleet and thus to manage their transport services more closely, and sharing information. Furthermore, IT has a significant impact on many other aspects that are related to the process of service innovation such as service creation-focused strategy, service delivery-focused strategy and service interaction-focused strategy. These innovations are characterized as a technology bias for service management (Chen and Tsou, 2012; Van Riel *et al.*, 2004).

Previous researchers have focused on the consumer or supplier perspective in the use of IT and especially in the tourism industry (Ip *et al.*, 2011; Law *et al.*, 2009). Although an increasing number of researches have identified the importance of technology, the different roles of technology are still under discussion in service innovation field. How do and will these concepts influence businesses and organizations in the service sector? What will be the consequences? What are the opportunities and pitfalls?

Thus, the purpose of this paper is to review the dominant role which technology plays in the New Service Development (NSD) process and discuss future research opportunities. This literature review provides the developments of scholarly research in the use of IT during the NSD process over the last decades. This paper may be of interest to academics who are already studying service innovation or NSD-related scientific areas, or researchers who have been introduced to the field but they are interested in examining more specific insights into where current research topics in this literature can be located, and how they may contribute to them.

The structure of the rest of the paper is as follows: the next section analyzes the methodology used for the study. Then, the findings of the analysis of the papers are provided. Finally, conclusion and suggestions for future research conclude the paper.

Methodology

As it has already been stated, the aim of this paper is to examine the current state of IT in NSD. Studies were identified using a three-phased literature review methodology, which was suggested by Webster and Watson (2002), and has been previously used in NSD research. First, a search of the extant literature reviews was done to select the databases and keywords of the basic search. Then, the backward search was implemented to examine the references of the selected papers and finally the forward search to examine the citations of the selected papers in order to increase their amount. After the selection of the papers, these were classified according to their content. Figure 1 presents the stages of the literature review methodology.

[Insert Figure 1 here]

The search was done in Scopus, Science Direct, Web of Science and ABI/INFORM using the following keywords 'New service development', 'Innovation management and new services', 'Service innovation process', 'Service innovation strategy' and 'Information Technology'. Papers published in academic journals and proceedings of conferences were selected without limiting them in a specific period (De Jong and Vermeulen, 2003; Kitsios and Kamariotou, 2018; Papastathopoulou and Hultink, 2012). The admitted journals belonged to fields of Marketing,

Strategy, Innovation, Management, Technology, because NSD is a vast field of research (Kitsios *et al.*, 2009). Finally, published papers were only in English.

Overall, 846 articles were gathered using keywords in all databases. According to the limitations of language and the source of publication, articles reduced in 526. Then, scanning their titles, 496 articles were found relevant with the aim of this paper. Next, examining their abstract, 341 were accepted. A number of studies were rejected because their full text was not accessible. A prompt investigation was conducted to verify them. This second overview highlighted that all of them should be included. So, 155 articles were examined according to their full text. Duplicate articles were deleted and 107 articles were identified. In these 107 articles, 37 were added from the backward and forward search and thus a total of 144 articles were revealed (Figure 2). Search was completed when it came to common articles from all databases and different combinations of keywords. Therefore, it was concluded that the critical mass of relevant literature sources had been collected (Webster and Watson, 2002).

[Insert Figure 2 here]

Papers were analyzed based on their concept. Papers were categorized according to their content into the characteristics of services, the critical success factors in NSD process and in different sector, the role of IT in the NSD process. A significant observation is that researchers have focused on stages and critical success factors on NSD from the early studies. The last decade, researchers examined the factors which affect the success of new services focusing on Information Technology and digitalization.

Classification of papers

Although researchers studied the scientific area of NSD the last three decades, half of the papers have only been published in the last fifteen years. Such a finding highlights both the significance of the area and its continuous development. Figure 3 presents the number of papers per concept. The majority of papers focus on critical success factors. Figure 4 presents the evolution of papers for this concept.

[Insert Figure 3 here]

[Insert Figure 4 here]

Table 1 presents the number of published papers per journal or conference. The majority of papers have been published in the following journals; Journal of Product Innovation Management, The Service Industries Journal, Journal of services Marketing, Journal of Service Management, European Journal of Marketing and International Journal of Service Industry Management.

[Insert Table 1 here]

[Insert Figure 5 here]

Analysis and Synthesis

Critical Success Factors in NSD

It is understood that businesses should design and develop new services strategically and should focus on success factors, in order to organize new services and persuade customers to buy them. There is a risk that service design can be considered as a combination of all the tangible and intangible service details which are necessary for a better customer experience. In service design, aspects concerning the service environment, process and employee are defined and linked effectively for an improved customer experience. The service must be useful, accessible and demandable by customers, as well as it intended to be effective, efficient and different from the competitors (Akoğlu Kozak and Acar Gürel, 2015). So, several factors have been studied by researchers in order to maximize the efficiency of the process as well as the success of the new service.

Employees' participation in NSD is a significant factor which has been mentioned by many researchers. The involvement of employees in NSD reinforces the generation of ideas, the reduction of uncertainty, the better understanding of customer needs, the feedback which is given for the new service to be produced and therefore the better design, development of the service and control before the final market introduction (Ottenbacher *et al.*, 2006; Ottenbacher and Harrington, 2010).

Specifically, frontline employees come into contact with customers and provide important information for their needs (Golubovskaya *et al.*, 2017). Frontline employees learn the preferences of customers and enhance the success of the new service. They should be trained to promote new services effectively (Golubovskaya *et al.*, 2017). Involving employees in the development of new services is better when there are incentives, either financial or not (such as recognition programs) (Boukis and Kaminakis, 2014). Employees' behavior affects the reactions and behavior of customers for the new service (Ottenbacher and Harrington, 2010). So, they give a competitive advantage as a resource that is not copied (Ottenbacher *et al.*, 2006). Frontline employees interact with customers and learn about their needs. Frontline workers contribute to innovation services, because knowing the needs of customers they have the ability to suggest new ideas that will satisfy their needs.

Except from employees' participation in NSD, another significant factor is the involvement of clients in all stages of the process because it is an effective strategy for developing a successful service. The significance of customer involvement is that it is an effective strategy of improving the success of new services (Konu, 2015). Customer co-production indicates that customers actively participate in service innovation and they are more satisfied with services through interactions with service providers and giving their feedback (Ryu and Lee, 2015).

Resources are another critical success factor which supports the development of new services. The innovation process is characterized by uncertainty, so resources such as human, financial, technological are required to support innovation in the development of new services. These resources are related to the business strategy, the knowledge, IT, skills of employees, the structure of the organization and communication with customers (Yang and Kankanhalli, 2013). Businesses have developed innovative strategies for NSD and use the appropriate resources to develop the process and thus gain competitive advantage. Resources that affect each stage of NSD and are they divided into organizational, natural resources and related knowledge. In the first category resources are related with the structure, control, reactions and relationships of members of the company. The second category includes resources such as materials, location, technologies and facilities. The

third category includes resources such as education, knowledge and skills of employees. Technological resources are required for the dissemination of information, such as those concerning customer needs and they can significantly contribute to employees' education and knowledge sharing (Yang and Kankanhalli, 2013).

Market synergy involves the market cooperation with suppliers and the communication (Eveleens, 2010). An important variable of this factor concerns customer information about their needs. Information is required by customers about their needs and preferences in order to increase customer preference in specific service (Kitsios and Kamariotou 2018). More analytically, communication with customers is a source of ideas and their involvement in the innovation process enhances the alignment between innovation and customer needs and reduces the time of introduction the new service in the market (Jeong and Lee, 2017). Communication with customers is enhanced by the use of technology. Customer involvement in the innovation process for new services increases the understanding of their requirements from the business and customers feel more commitment. Firms that emphasize the needs of their clients innovate more and customers are willing to pay to purchase this service, because it adds value to them and they will repeat more possibly their purchase (Grissemann *et al.*, 2013).

In order to maximize the customers' information about their needs, businesses implement market research before developing new service and testing them before entering them to the market, to get feedback and to improve the features that diverge from the needs which clients have declared. Agent main importance is the synergy of the new service strategy of marketing, promotion and distribution systems in order to increase the value that will be realized by customers (De Jong and Vermeulen, 2003).

Finally, alignment is essential for businesses to develop their services successfully. Alignment is one of the most important factors of success of new services according to researchers. It refers to the connection between objectives, business and new service strategy. This gives the opportunity to managers to be more knowledgeable about business strategy in conducting service innovation. Benefits of alignment are the strategic selecting of the markets to enter. Secondly, strategically planned projects enable the business to take advantage of synergy between similar innovation projects. Thirdly, it provides the learning thus businesses can repeat previous actions of successful services (Ryu and Lee, 2015; Van der Panne *et al.*, 2003).

These factors are sorted in Table 2 according to their contribution in NSD process. Factors are classified in order to guide managers to reinforce those which are weak. These categories concern idea generation, organizational structure, NSD process, resources, market synergy and strategy. All these factors should be taken into consideration by managers for the successful NSD. It is obvious that researchers have not payed attention to the importance of IT for the success of new services.

[Insert Table 2 here]

Information Technology and digital tools in NSD

Information Technologies can support the information sharing between customers and business, the production process and they can accelerate the delivery of new services to customers. Also Information Technologies constitute an alternative way to get businesses feedback from customers about new services. Many organizations introduce technology-driven service interfaces without

considering consumers' needs. Thus, new services fail. However, employees' participation in this effort is very important. They contact with customers so they can provide information for the times that the demand of a new service is high or low. Also, they can provide information for the most effective delivery way of new services, according to customers' view. The most important element of their participation is that they interact with customers and they try to make new services tangible. Finally, managers should support these activities and encourage the use of Information Technologies and employees' participation, in order to minimize the risks of new services. Designers must understand customers' behavior and experiences in order to develop meaningful services. Thus, Information Technology facilitates the organizational learning process (Chen and Tsou, 2012; Van Riel *et al.*, 2004).

Businesses can benefit from Information Technology when they design or modify new service processes. Organizations use Web services for customer information inquiry and consultation, enrich multi-channel purchasing features and enhance after-sale services. These businesses which use Information Technology applications to analyze and identify customer needs and preferences can increase their service innovation processes. Previous findings conclude that technological capability positively affects customer service and service process innovation. Quite honestly, these results have important managerial implications as managers try to increase performance by using technological resources (Akoğlu Kozak and Acar Gürel, 2015; Chen and Tsou, 2012;).

Both the generation of new ideas and the development process require knowledge sharing which is something that is facilitated by IT (Kitsios and Kamariotou, 2018). It also improves the quality of services as the Internet supports organizations not only to develop but also to distribute their services more efficiently. That along with the fact that it helps to limit the costs eventually increase customer's satisfaction (Ottenbacher and Harrington, 2010). Businesses can also increase the value offered to customers and personalize service by adopting it to customer's needs since they can take advantage of new technological developments. When consumers provide accurate and timely information about their needs and participate in the NSD process innovate and design services appropriately (Bantau and Rayburn, 2016; Chen and Tsou, 2012; Van Riel *et al.*, 2004). What the real challenge is though according to the researchers, is that the effective usage of these technologies in the NSD process requires knowledge, training and support from employees (Gölpek, 2015).

Critical Success Factors and IT in different service sectors

Opportunities to develop new services can be opened up by the rapid technological changes. Numerous service innovations ranging from electronic government and e-health to advanced multi-channel management, customization of services, introduction of self-service concepts and virtual project teams have been made possible thanks to recent trends in Information and Communication Technologies (Barrett *et al.*, 2015; Carbonell and Rodriguez Escudero, 2015). Moreover, financial businesses and businesses in health sector use Information Technologies to provide new flexible and innovative services. So, surveys in tourism should be continued to investigate the impact of Information Technologies in the success of new services. As, financial sector was the first area which was investigated in this field researchers have focused on management support, strategy and communication in order to provide successful financial services (De Smet *et al.*, 2013).

Weng and Huang (2012), in their research in the health sector concluded that through the knowledge for customers business can produce services that will satisfy them. Hospitals through

knowledge about clients can offer innovative services and they can increase their performance. When employees are in contact with customers, the knowledge about them leads to more innovative ideas, which enhance the performance of the hospital.

In e-government the significant success factors are the behavior of the organization for the service innovation, the idea generation sources, the actions for the development, the organizational structure impact, the resources allocation impact within the organization as well as the impact within the relevant marketplace (Angelopoulos *et al.*, 2010).

In contrast, as the failure of the new services is relatively high, the hotels have to design and develop their service systematically in order to take advantage. The most common reasons for unsuccessful efforts are related to the unsystematically design and lack of service design knowledge and skills. Hotels that have a formal process, systems and processes, improve their efficiency and the new service is introduced more quickly in the market (Kitsios and Kamariotou, 2016a; 2016b; Kitsios *et al.*, 2009). Moreover, experiences of the employee can provide useful information, since they have an important role in the service system, especially in customer interaction. The main goal in service design is to satisfy the customer's needs. Employee understanding, motivation, commitment, and support for NSD projects are important for the development of hospitality services. It was about to say that employees need to understand and support the service in order to be fully committed to it because their training is not enough for their involvement in NSD process (Ottenbacher and Harrington, 2010).

The above analysis presents that despite the development of new technologies, managers in the financial sector have used them in order to develop innovative services. Hotel managers have to invest in resources in order to use Information Technologies effectively. Despite the increase of social media, artificial intelligence and networking communications, managers face many difficulties to use them during the development process. They do not have the necessary resources, they are not informed about the benefits of these technologies and how these technologies improve the quality of new services. This is an opportunity for further research as the specific sector is characterized by the interaction between customers and policy in order to improve services.

Figure 6 presents the conceptual model based on the analysis of the existing literature. Information technology plays a significant role for managers who develop new services and in the formation and functioning of service ecosystems. Therefore, firms need resources such as information, skills, and knowledge in order to create value for those actors engaged in the NSD process. Firms have to combine many aspects such as service concept, client interface, service delivery system, and technology in service innovation process in order to increase value for customers. Service innovation is an emergent, interactive, and dynamic intensive such as knowledge, information and communication flows between providers and customers.

Digital environment help firms to identify opportunities for service innovation, gather information about new digital devices, channels and customers' behavior. Firms can use business analytics or Artificial Intelligence in order to access data, convert data into usable information, access to consumer insights and make more informed strategic decisions about new services. Improvements in IT and mobile communication technologies, allow firms to provide better service quality, improve customer satisfaction and extend customer relationships. That is, how can firms exploit opportunities and create value through developing digital services that utilize existing components? (Bantau and Rayburn, 2016).

Organizations act in a digital environment and need skills to enable new digital roles and reap the benefits of digital innovation. Managers have to provide flexible structures, innovative climate, and promote continuous learning and cooperation in order to support employees to deal with new technologies (Nylén and Holmström, 2015). Organizations interact with customers in order to be informed about their needs. Thus, they need skills to use digital technologies and improve their relationships with customers. How do customers and organizations interact? Which technologies use firms during this interaction? Web-based services or Internet/mobile self-service? (Barrett *et al.*, 2015; Nylén and Holmström, 2015).

[Insert Figure 6 here]

Conclusions

The purpose of this paper was to review the dominant role which technology plays in the NSD process and indicate the critical success factors should managers have in mind during the implementation of service projects as well as the extent to which NSD lead to technological investments. Managers' assistance can be of great importance so as to understand the characteristics of new services, the factors which affect their successful development as well as the stages which are included in the NSD process. It is anticipated that the effective development of new services will be increasingly important in years to come as a result of not only rapid developments in new technologies but also the changes in customer needs or preferences.

Theoretical and Practical Implications

The paper is important for practitioners who are interested in studying to expand knowledge in this area and they can use this literature review to position their research. Particularly, this paper presents an important field for future research and supports the understanding of the role of IT as a significant resource in innovation and explicating the implications on the development of new services. As digital components in services provide many opportunities for firms, service designers can engage actors of the innovation in the NSD process in order to co-create new services and increase their value for customers. Also, it helps academics who have already been studying service innovation or NSD-related scientific areas, or researchers who have been introduced to the field but they are interested in examining more specific insights into where current research topics in this literature can be located, and how they may contribute to them. The area of IT is well positioned to provide challenges in the field of service innovation and make valuable theoretical contributions. This paper is a promising start in this direction but a broader and sustained effort is called for and scholars can apply broader IS theoretical perspectives and include studies in other business areas. The IT research field has provided opportunities for future research but also a practical guide to develop practices for service design. This paper outlined some issues and some possible avenues in this regard but academics can further examine how digital components such as the characteristics of infrastructures and of digital platforms that foster service innovation.

Limitations and Future Research

It is imperative that managers realize that if they want not only to survive but also to be competitive. In the current increasingly demanding environment they have to improve customers' satisfaction. This can be achieved by improving service quality and by being innovative in service design. Thus, it is equally important to examine both how to enhance employees' participation in

the NSD process using new technologies and how to meet customers' needs by producing innovative services. Possible avenues of future research include the determination of how employees' training and knowledge sharing could be improved through the use of IT in order to work more flexibly and be more creative so as to generate ideas for new services.

Future researchers could also examine the characteristics of each sector in order to identify how IT can impact the development of new services. Moreover, future researchers could identify how new technologies could be used in NSD stages, such as idea generation and service concept, service development, service testing and launch. How managers in different sectors could use IT to generate new ideas, evaluate them, develop the marketing plan, service 'prototype', launch the new service to the market and get feedback?

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Figure 1. Stages of literature review methodology

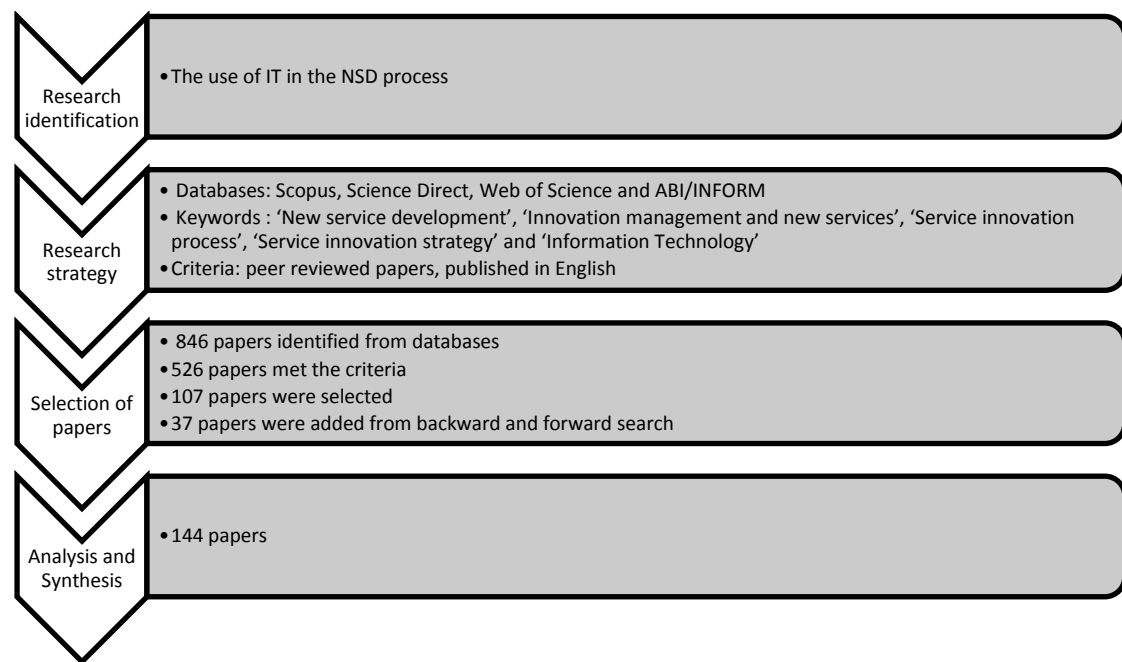


Figure 2. Selection process of papers

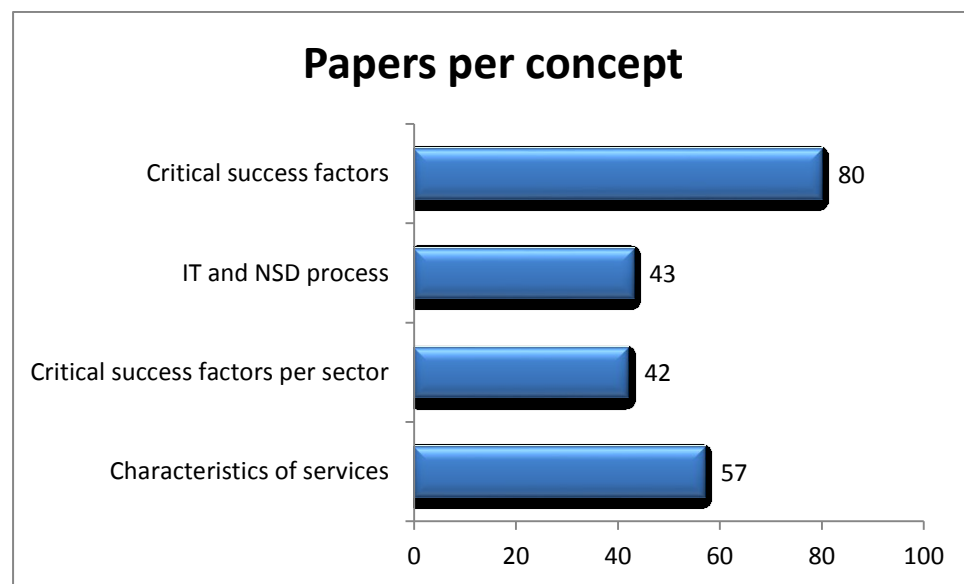


Figure 3. Papers per concept

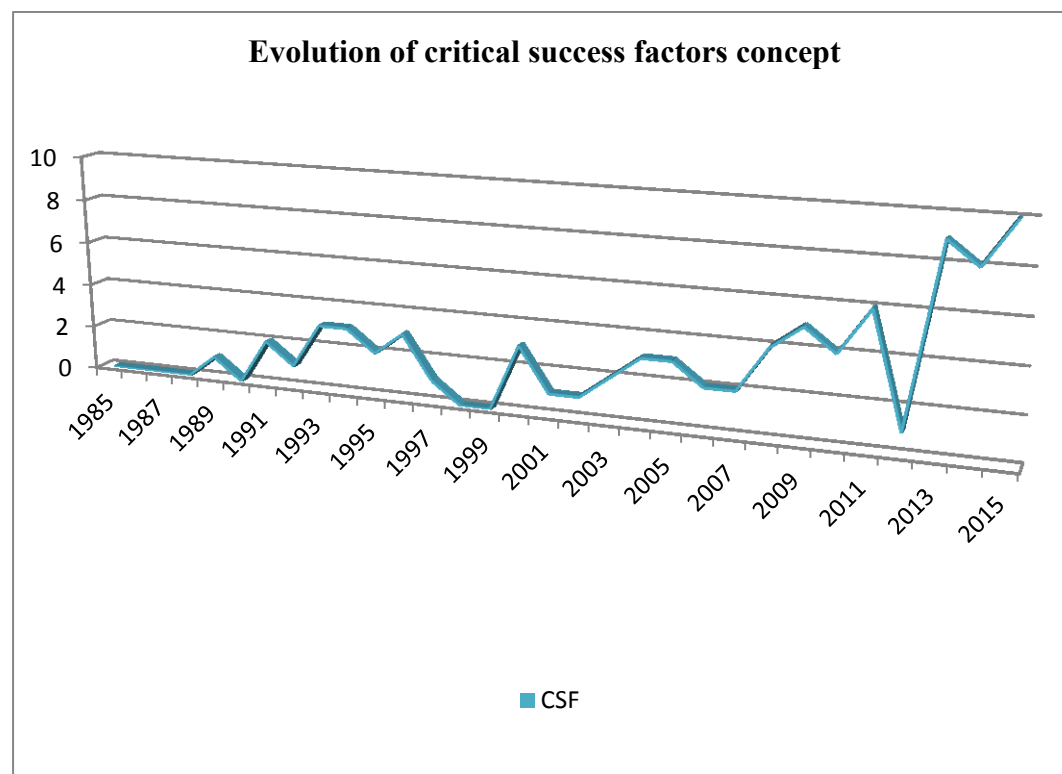


Figure 4. Evolution of critical success factors concept

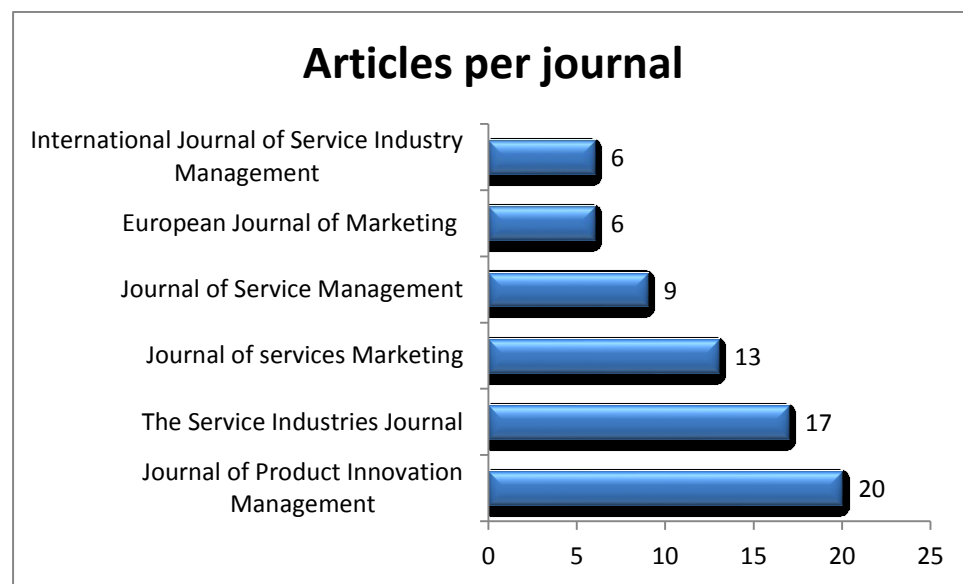


Figure 5. Articles per journal

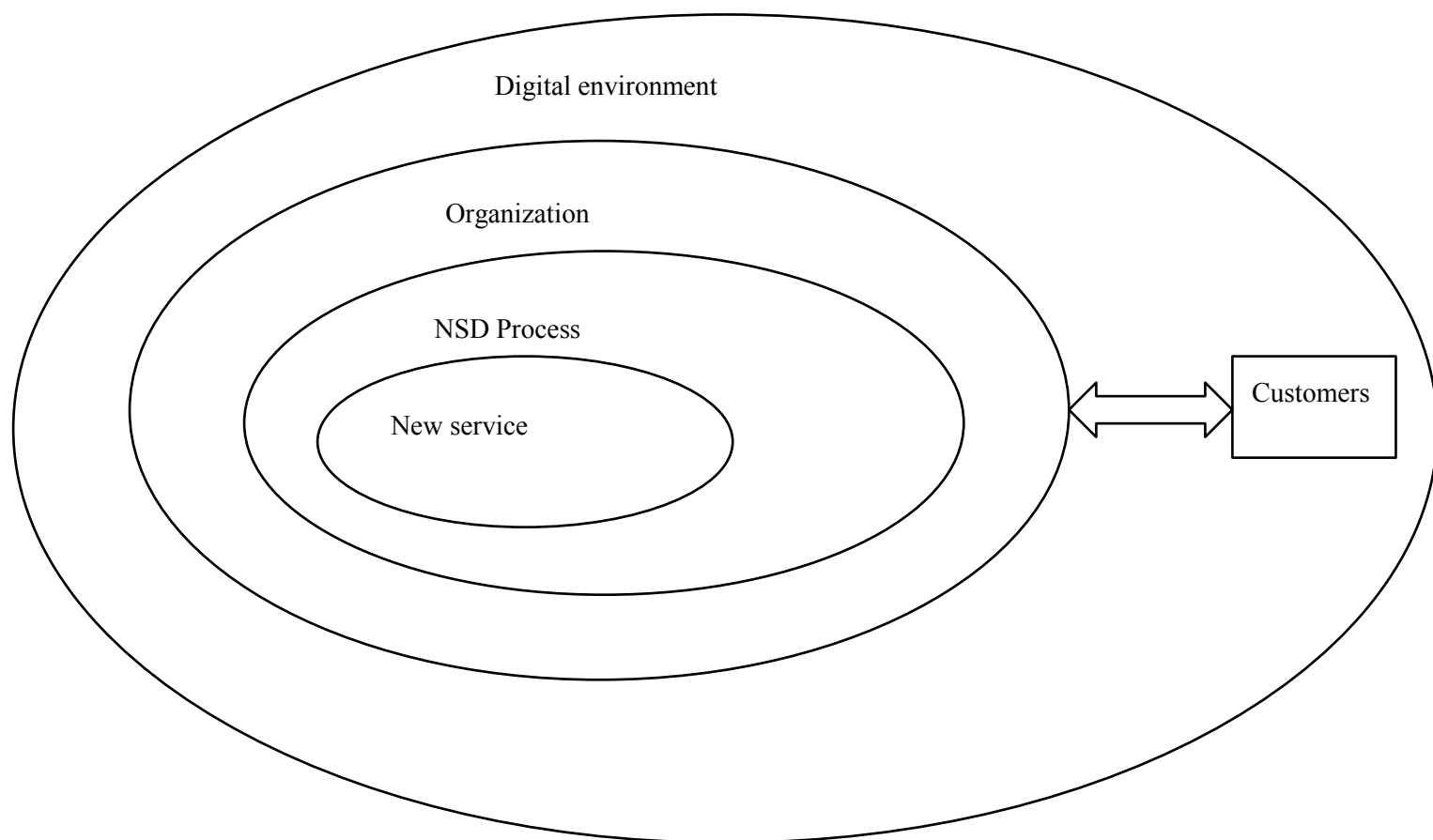


Figure 6. Conceptual framework

Journals	Number of articles
Journal of Product Innovation Management	20
The Service Industries Journal	17
Journal of services Marketing	13
Journal of Service Management	9
European Journal of Marketing	6
International Journal of Service Industry Management	6
Journal of Service Research	5
Industrial Marketing Management	5
Procedia-Social and Behavioral Sciences	5
International Journal of Hospitality Management	4
Journal of Business Research	4
Journal of Operations Management	4
International Journal of Management Reviews	3
Technology Innovation Management Review	3
Technovation	3
European Management Journal	2
International Journal of Data Analysis Techniques and Strategies	2
International Journal of Bank Marketing	2
International Journal of Innovation Management	2
Journal of Hospitality & Tourism Research	2
Journal of Management Studies	2
MIS quarterly	2
Production and Operations Management	2
Research policy	2
Tourism Management	2

Tourism	2
Applied Soft Computing	1
Asia Pacific Journal of Marketing and Logistics	1
Asian Social Science	1
British journal of management	1
Cornell Hospitality Quarterly	1
Cornell Hotel and Restaurant Administration Quarterly	1
Current directions in psychological science	1
Design Management Journal	1
Expert Systems with Applications	1
Global Journal of Business Research	1
Government Information Quarterly	1
IEEE Transactions	1
International Journal of Contemporary Hospitality Management	1
International Journal of Innovation and Learning	1
International Journal of Management and Marketing Research	1
International Journal of Management Research and Technology	1
International Journal of Operations & Production Management	1
International Journal of Public Sector Management	1
International Journal of Research in Marketing	1
International Journal of Tourism Research	1
Journal of Information Technology Services	1
Journal of Applied Business Research	1
Journal of Business & Industrial Marketing	1
Journal of Business Strategy	1
Journal of Chemical & Pharmaceutical Research	1

Journal of Engineering and Technology Management	1
Journal of Financial Services Marketing	1
Journal of Global Marketing	1
Journal of Management & Organization	1
Journal of Retailing and Consumer Services	1
Journal of Service Theory and Practice	1
Journal of the Academy of Marketing Science	1
Management decision	1
Managing Service Quality: An International Journal	1
Operational Research	1
Pacific Asia Journal of the Association for Information Systems	1
Procedia CIRP	1
R&D Management	1
RESESR	1
Revista Brasileira de Gestão de Negócios	1
Service Business	1
Science	1
Strategic management journal	1
The Cornell Hotel and Restaurant Administration Quarterly	1
The Journal of Marketing	1
The Learning Organization	1
Total Quality Management	1
Tourism and Hospitality Research	1
Transforming Government: People, Process and Policy	1
Conferences	Number of articles
PACIS	3

NCOR	3
ACMIS	1
ANZMA	1
EAAE Seminar	1
EMCIS	1
ICIE	1
IEEE ICMIT	1
ISPIM	1

Table 1. Papers per journal/conference

New Service Development Success Factors	Frequency of New Service Development Success Factors (%)
Idea generation	
Customers' participation	21,87
Employees' participation	15,62
Frontline employees	3,12
Organizational structure	
Management behavior	7,81
Management Support	9,37
Organizational climate	6,25
Innovation Climate	6,25
Structure of the organization	4,68
Interdepartmental group	4,68
Learning	4,68
Official procedure	3,12
Motivation of employees	1,56
Organizational change	1,56
Sharing knowledge	1,56
Leadership	1,56
Management problems	1,56
Organization procedures	1,56
New Service Development process	
Information Technology	14,06
Engaging employees	12,50
Actions of Marketing	9,37
Employees' training	6,25
Interdepartmental group	4,68
Program for the introduction of the service at the market	4,68

Knowledge of the process	4,68
Skills of Research & Development department	4,68
Business analysis	3,12
Experience in the implementation process	1,56
Payment policy	1,56
Resources	
Resources and skills	4,68
Skills of Research & Development department	4,68
Employees capabilities	1,56
Frontline employees capabilities	1,56
Investing time and money	1,56
Market synergy	
Quality of service	17,18
Communication	9,37
Customer Information	9,37
Management support	7,81
Cooperation	6,25
Defining customer needs	4,68
Knowledge of the market	1,56
Market Attractiveness	1,56
Strategy	
Aligning resources / strategies / market	10,93
New Service Development strategy	3,12
Innovation Strategy	3,12

Table 2. Classification of Critical Success Factors