

## FORMATION OF A CONCEPTUAL MODEL FOR NEW SERVICES

Skačkauskienė I., Svogzlys P., Lemańska-Majdzik A.\*

**Abstract:** The purpose of this paper is to formulate the conceptual model of new service development and provide an algorithm for its implementation. The performance of the model, selection of individual elements and the interaction with the external environment are based on the methods of abstracting, logical analysis, synthesis, analogy, and generalization of a complex. The results show that some new service development models are not detailed enough. Usually, the meaning of the elements attributed to the model and the specificity, frequency, and importance of the tasks performing in particular steps are unclear.

**Keywords:** new services development, conceptual model, NSD, algorithm, composition

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### Introduction

In order to keep up with the trends and adapt themselves to the rapidly changing needs of consumers, all business subjects are forced to improve and update the range of services they already have and create new services that even do not have any analogous on the market. The models of new services development (further – NSD) are significantly important in this context. The application of such models allows organizations to create innovative services faster and get familiarized with the targeted customers of the new services.

The models of NSD are frequently chosen as the research subject by many modern researchers (Shekar, 2007; Burger et al., 2010; Lin and Hsieh, 2011; Edvardsson et al., 2013; Santos and Spring, 2013; Santana et al., 2016). However, it should be noted that the majority of analyses of the specific models and concepts of NSD provide only a sequence of actions that a business entity should follow in order to develop a new service. Usually, authors do not provide any rational reason why an exact type of model or individual elements have been chosen as well as the applicability of a particular model and the benefits for modern organizations are not described. In order to eliminate the identified defects, it would be expedient to present a NSD model with a clearly detailed structure, interaction with an external environment, rationally selected elements and clearly connections between them in

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\* Prof. **Iłona Skačkauskienė**, Doctor of Social Sciences Professor, Head of Management Department at Vilnius Gediminas Technical University, Lithuania; MSc. **Povilas Švogžlys**, PhD Candidate of Social Sciences in Vilnius Gediminas Technical University; Eng. **Anna Lemańska-Majdzik** Ph.D., Czestochowa University of Technology, Faculty of Management.

✉ Corresponding author: lemanska@zim.pcz.pl

✉ ilona.skackauskiene@vgtu.lt; povilas.svogzlys@vgtu.lt

order to make the development of new services more efficient. The aim of the research – to formulate the conceptual model of NSD and provide an algorithm for its implementation. The following goals of the research were set: 1) to analyse the models and concepts of NSD found in the scientific literature; 2) to analyse the composition of NSD, 3) to formulate a unique model of NSD and provide an algorithm for its implementation based on the results of the carried-out research; 4) to provide the suggestions for the further researches. The research is based on the methods of abstracting, logical analysis, synthesis, analogy, and generalization of a complex.

### **Critical Assessment of New Services Development Models**

In order to attract targeted customers while the competition is growing rapidly, the service providers are forced to take new actions and adopt new management solutions that could refresh the existing package of services or create beneficial conditions for the NSD. Researchers and business entities are constantly looking for reasonable and practically-proven tools that would ensure the fluent implementation of this process. The models of NSD might be described as one of those tools. These models improve the quality of the provided services, increase the speed of implementation process, allow an effective involvement of employees and let to identify the specific needs of the targeted audience more accurately. In accordance with the scientific literature, the models of NSD can be classified into 3 groups: linear, cyclic (Menor et al., 2002; Stevens and Dimitriadis, 2005; Froehle and Roth, 2007; Lin and Hsieh, 2011) and complex (Johnson et al., 2000; Stevens and Dimitriadis, 2005). The process of the cyclic models forms a complete cycle of development within a particular period of production, development, implementation, etc. The linear models provide the stages of NSD in a vertical or horizontal order. Meanwhile, the complex model is unbound, has no strict frames and the focus is on specifications of NSD including such factors as organization, customers, methods, competitors, etc. (Stevens and Dimitriadis, 2005; Edvardsson et al., 2013; Yu and Sangiorgi, 2014).

Different types of NSD models are interconnected by specific stages and features. It is noticed that the following features are usually distinguished by modern scientific literature:

- *Components oriented towards business entities.* In order to broaden the approach to NSD, authors tend to assign specific tasks to each stage of the process. (Murthy et al., 2008, Yu and Sangiorgi, 2014; Santana et al., 2016).
- *Staff involvement.* The collaboration of employees is considered as an attempt to involve staff with the appropriate qualification in the process of NSD (Santana et al., 2016; Edvardsson et al., 2013; Yu and Sangiorgi, 2014).

The rapid development of the service sector has revealed the need to improve the models of NSD. Most of the researchers in this field try to upgrade those models according to the newest trends of the service sector, consumer behaviour or indications of previous models while adapting them to the current market needs.

Unfortunately, there is a lack of tools that could cover the whole cycle of NSD and help to manage this process at each stage (Klein, 2007). It is noticed that the models of service development presented in the scientific literature have defects that can be noticed during or after the process:

- *Narrow scope* – some authors (Froehle and Roth, 2007; Santana et al., 2016) tend to focus on narrow scopes while they design new models for services development and the targets are very precise: people with disabilities, planning of organization resource, aspects of culture, tourism or ethics, etc. Although, the models are focused on a specific problematic field, they cannot be applied to any other fields due to specific elements. This situation make the necessity to create a more universal model for NSD.
- *Verification of launch and post-launch review* – it is noticed that some well-known researchers tend to distinguish the elements related to the monitoring of this process during the stage of new model launching (Johnson et al., 2000; Murthy et al., 2008; Gaus et al., 2013). However, it is not clear what action should be taken to ensure a fluent process of monitoring. Also, when the models with all above-mentioned elements are used, are lots of confusion appear because it is not obvious when the process of NSD ends and the process of providing the service starts.
- *Involvement of consumers* – according to Svendsen et al. (2011) the involvement of consumers is an important factor that might affect the success of a new product. However, Lee and Chen (2009) claim that NSD is highly unsuccessful process due to a poor definition of process and a lack of focus on consumers. In accordance with Helm and Graf (2018), the level of consumer involvement in the development of new services is still low-rated.

The above-mentioned problematic aspects made a necessity to create a unique model of NSD with a rationally based structure that would make it flexible to adapt to the needs of companies in the service sector.

### **Composition of New Services Development**

In order to properly emphasize the distinctive features of a NSD model, the process of formation usually depends on the choice of model classification type that could have an impact on the overall pattern of the model, the arrangement of elements, and the choice of elements in some cases as well. Therefore, it is very important to evaluate the characteristics and problematic aspects of every individual model. The cyclic and linear models have been described as sequential development models by Stevens and Dimitriadis (2005). They distinguished 3 the most frequent defects:

- Implementation of “stage-gate” systems led to time-consuming and overly bureaucratic processes that slow projects down.
- The description of the stages does not integrate the way firms organise development teams.

–Sequential models do not help to define what must be produced during each stage.

In accordance with the above-mentioned defects, it can be assumed that a large number of models of cyclic or linear types can be characterised by a lack of details. Johnson et al. (2000), Bullinger and Schreiner (2006), Burger et al. (2010), Lin and Hsieh (2011) have tried to solve this problem by introducing new models of NSD. The authors provided many additional tasks that business entities should carry out at each stage of the NSD. In this case, the individual stages would be detailed too. However, it is noticed that these models are not informative enough because the role of individual participants and groups of factors that might have an impact on this process are not distinguished. Although, the models of the cyclic and linear types usually have a clear and simple structure, the particular rules must always be followed in order to maintain the original form of these models. Because of assigning some specific elements to cyclic or linear models it is not always possible to achieve the original ideas. In accordance with these aspects, a complex type has been chosen as the main form of a unique model of NSD. This type has a sufficiently free structure and allows to integrate more elements easily.

Many controversial opinions about the components of the NSD model still appear in scientific literature. On the other hand, researchers are trying to assess the importance of each component and the optimal number of components that are needed for a successful process of implementation. Individual components of NSD are analysed in the context of servitization. It means that manufacturing companies develop the capabilities needed to provide services and solutions that complement their supply of traditional products (Gaiardelli et al., 2014).

Role of the consumer was not so significant in the terms of NSD, many different interpretations can be found in the analyses of consumer needs and involvement in this process (Alam and Perry, 2002; Stevens and Dimitriadis, 2005; Yu and Sangiorgi, 2014). It should be noted that a consumer as an individual component and its interaction with any business entity are referred fragmentary in the models of NSD. Edvardsson et al., (2013) point out that the lack of information about the fact that interaction between a service provider and consumer can increase the efficiency of the process of NSD.

Goldstein et al., (2002) claim that it is necessary to define a proper combination of physical and non-physical components in the process of NSD. In this case, author highlights a service design as the key component of NSD that can be described as an engine of many solutions for service delivery systems and service meetings. Meirovich and Bahnan (2008) approve the previous-mentioned opinion. They have been studied the connections between individual service components, consumer emotions, and satisfaction, and found out that the quality prioritization in the stage of planning has a positive impact on the successful meeting of consumer expectations.

Gaus et al., (2013) have examined the significance of communication in the context of NSD. According to the authors, the aspect of communication is found in all

model creation stages related to strategy, changes and cultural level of this model. This aspect is also relevant to other business-related entities such as banks, investors, suppliers, competitors, employees or potential consumers. Stevens and Dimitriadis (2005) have a similar opinion. They claim that strong internal communication is significantly important in the process of NSD as it delivers better results.

In terms of stages of NSD, the cyclic models require the smallest number of them. Typically, they have only 4 stages. The linear and complex models of NSD have a higher number of stages that can vary from 6 to 12. It is noticed that a lower number of stages is usually compensated by some additional tasks or actions that the business entity should perform. In order to create a conceptual model for effective NSD, it is important to compare models of a similar profile and identify the most appropriate stages (see Table 1).

**Table 1. The stages and features of NSD models** (Skačkauskienė et al., 2018)

Author, year	The stages of NSD models which are most often identified in literature														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Identifying needs	Idea generation and screening	Analysis	Service design	Staff training	Concept formation	Concept testing	Service development plan	Development	Service testing	Service implementation	Service launch	Sales / marketing operations	Commercialization	Monitoring
Stages of Cyclic Service Development Models															
Johnson et al. (2000)		✓	✓	✓					✓			✓			✓
H. J. Bullinger, P. Schreiner (2006)	✓	✓				✓		✓		✓	✓				
C. M. Froehle A. V. Roth (2007)			✓	✓					✓			✓			
D. Kindström C. Kowalkowski (2009)	✓								✓			✓	✓		
Stages of Linear Service Development Models															
I. Alam ir C. Perry (2002)		✓	✓	✓	✓	✓				✓					✓
A. Shekar (2007)	✓	✓	✓	✓		✓		✓	✓	✓	✓				
T. Burger et al. (2010)	✓	✓		✓		✓				✓	✓	✓			
F. Lin, P. Hsieh (2011)	✓	✓		✓							✓				✓
F. E. Santana et al. (2016)	✓	✓	✓	✓		✓	✓				✓				
Stages of Complex Service Development Models															
D. N. P. Murthy et al. (2008)			✓	✓					✓						✓
J. B. Santos M. Spring (2013)		✓							✓					✓	
B. Edvardsson et al. (2013)	✓	✓	✓	✓		✓					✓				✓
E. Yu, D. Sangiorgi (2014)			✓	✓					✓			✓			
H. P. Hsu (2017)			✓	✓	✓			✓			✓	✓			
<b>Total number:</b>	7	9	9	11	2	6	1	3	7	4	7	6	2	2	3

The table shows that the idea generation and screening, analysis, service design, service implementation, and service launch are the most frequent stages NSD models. In accordance with the results of the analysis, the following most frequent stages found in the scientific literature were chosen as the key stages for creation process of the unique conceptual model: preparation, analysis, formation and implementation. The conceptual model for NSD (see Fig. 1) is dedicated to

emphasise the influence of the elements that have a direct impact. The competitive element marks the strengths and weaknesses of a new service that the business entity has to assess until the new service is developed fully. The consumer element describes the effort to involve the consumers in the process of NSD and use the experience of them. In order to define the integration of post-launch review elements, the stage of new service implementation was on the focus as well. It must be noted that the new model is quite universal due to its simple structure and rationally selected elements. As a result, it can be applied to any company in the service sector.

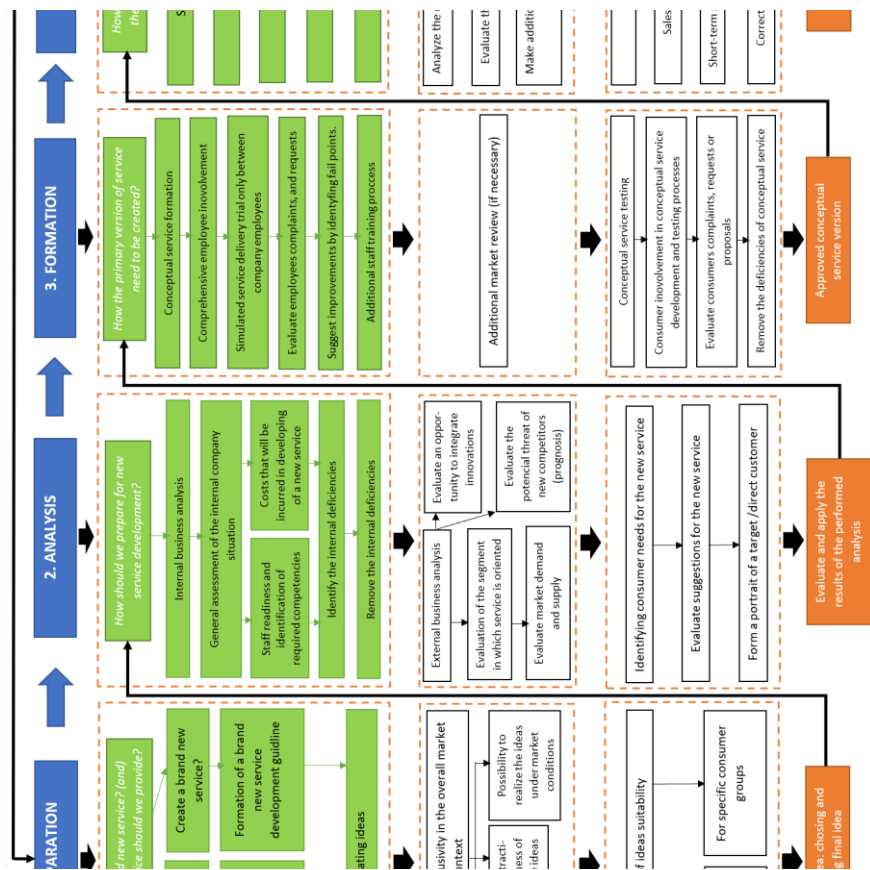


Figure 1. Conceptual 3C new services development model

All the implemented processes require a certain sequence of actions to perform them. Therefore, the conceptual model implementation algorithm is proposed for the conceptual model application.

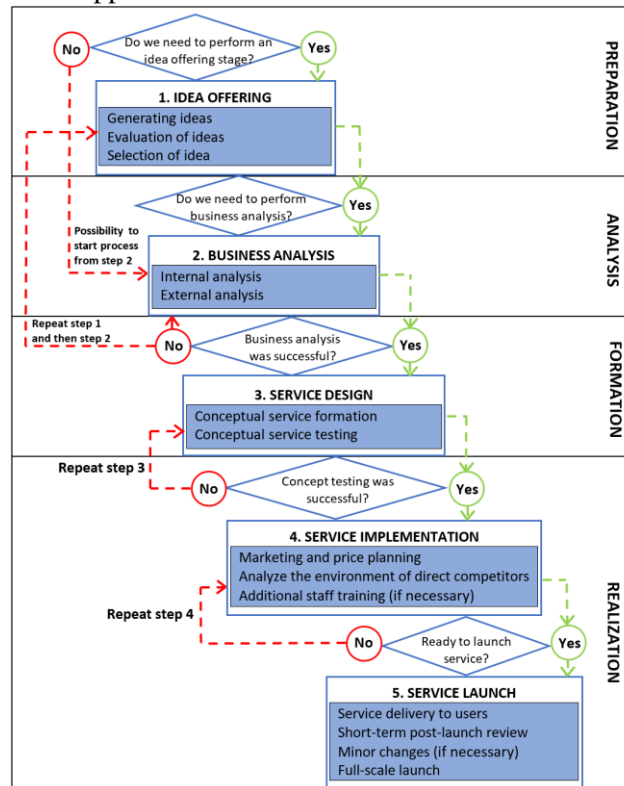


Figure 2. New services development algorithm

Each stage has few additional steps, and special tasks that might be performed by the user of this algorithm are assigned to every step. The first stage is the preparation. It consists of steps of generating, evaluating and selecting ideas. In the step of ideas generation, the business entity generates new ideas by using techniques of mind mapping, brainstorming or Six Thinking Hats. Due to the fact that the number of generated ideas usually depends on the oriented segment, the evaluation of ideas is done by using the selection criteria that evaluate novelty, uniqueness, and specificity of ideas as well as the factor of attractiveness to potential customers or specific groups is taking into account.

The second stage aims to assess the capability of a company to implement the chosen ideas in a process of NSD, i.e., the internal and external analyses are performed. The internal analysis evaluates the financial resources of an organization and the needed amount to develop a new service. The aim of external analysis is to collect more information about the potential competitors, additional opportunities for new technological innovations and the segment that the service is

intended to target. In this case, if the business entity already has the idea of a new service, it is possible to start the process of development from the stage analysis. If it is determined that the company is unprepared and unable to implement the chosen idea in the stage of analysis, it is proposed to return to the stage of preparation. It is possible to select and evaluate the chances to introduce an alternative idea in this way.

The third stage is about the formation. The main tasks of this stage is to form the concept of new service and test it. The concept-forming task is characterized by the fact that it must be done inside the company in order to include a larger number of employees. This stage provides a simulation of service delivery and is followed by observations and suggestions of employees about the development and improvement of a concept of new service. The customers are involved in the task of concept testing in order to assess their experiences and feedback.

The fourth stage is divided into 2 following steps: the implementation and launching of a new service. During the step of implementation, the following 3 tasks are assigned to a business entity: price, place, and promotion. The analysis of the potential reaction expressed by the competitors about a new service on the market must be maintained in this step as well. If it is needed, the additional training can be provided to the employees. A new service is delivered to the direct customers and the sales process is started during the step of launching. Later, a repeated review of this new service is maintained in the short term in order to eliminate the newly identified mistakes and ensure full-scale launch. If the business entity is not ready to launch a new service, it is proposed to repeat the tasks of the step of implementation.

From the managerial point of view, this model would allow for a better preparation for the new service development by assessing the innovation and competitiveness of new service, as well as contributing to the speed of this process.

### **Conclusions**

The results of the analysis revealed that a broader approach to the development of new services is needed. The models cannot adequately reflect the aspect of consumers involvement, do not interpret the effects of all direct factors enough and the clear definition of the significance of monitoring during the launch step is missing. It was noticed that some models are not detailed enough. Usually, the meaning of the elements attributed to the model and the specificity, frequency, and importance of the tasks performing in particular steps are unclear. In order to eliminate the identified defects, a conceptual model with 4 stages (preparation, analysis, formation, and realization) for NSD was introduced. This model is characterized by the clear and wide profile structure that allows to detail the model as well as to integrate additional elements of customers and competitors. The involvement of these elements allows to explain the impact of consumers and competitors as well as to determine their role in the overall context of NSD. The



conceptual model can be applied to any modern company in the service sector due to its versatility.

In order to implement the conceptual model, an algorithm was introduced as well. It is characterized by an analogical arrangement of stages and tasks. Due to the fact that time is one of the most important components of NSD that allows to create and offer a service to customers faster, the introduced algorithm provides a possibility to eliminate the stages that are not relevant anymore according to the previous business activities and other related circumstances. The algorithm is characterized by control questions that give an ability to decide when it is needed to repeat the previous steps or to move forward.

### Future Research

According to the fact that the introduced version of the NSD model is not the final one, the direction of further research can be divided into three stages. In the first stage, the analysis of the elements of this model would be carried out by using multi-criteria assessment methods. All elements and subsystems would be analysed separately as well as the interaction between them would be researched, and the connections between the elements and external environment would be determined. In the second stage, this model would be tried out under the real circumstances of a company in the service sector. Finally, the aim of the third stage would be to evaluate the duration of NSD during every individual step by using the method of PERT – Program Evaluation and Review Technique. According to Kaziliūnas (2009), this method provides a lot of useful information to the user and improves the control of the following internal processes: 1) this plan let to improve communication between employees, workgroups, and users of the organization and meet the requirements of time, resources and performance; 2) this method of process planning refers to a mathematically reasonable duration of a project; 3) the start, end, or any postponements of the work is visible on the linear plan; 4) it easier to identify the critical tasks that should be done with a higher priority than others. These directions of the further research would provide more information about the further possibilities of model improvements. They could show the real potential of this model under the circumstances of Industry 4.0 and servitization when the manufacturing companies try to develop a new service.

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#### FORMUŁOWANIE KONCEPCYJNEGO MODELU DLA NOWYCH USŁUG

**Streszczenie:** Celem tego artykułu jest sformułowanie koncepcyjnego modelu rozwoju nowych usług i dostarczenie algorytmu do jego implementacji. Wykonanie modelu, wybór poszczególnych elementów i interakcja ze środowiskiem zewnętrznym opierają się na metodach abstrakcji, analizie logicznej, syntezie, analogii i uogólnieniu kompleksu. Wyniki pokazują, że niektóre nowe modele rozwoju usług nie są wystarczająco szczegółowe. Zazwyczaj znaczenie elementów przypisanych do modelu oraz specyfika, częstotliwość i znaczenie zadań wykonywanych w poszczególnych krokach są niejasne.

**Słowa kluczowe:** rozwój nowych usług, model koncepcyjny, NSD, algorytm, kompozycja.

#### 形成新服务的概念模型

**摘要:** 本文的目的是制定新服务开发的概念模型，并为其实现提供一种算法。  
**模型的性能，** 单个元素的选择以及与外部环境的相互作用是基于复杂的抽象，逻辑分析，综合，类比和泛化的方法。 结果表明，一些新的服务开发模型不够详细。  
**通常，** 归因于模型的元素的含义以及在特定步骤中执行的任务的特异性，频率和重要性尚不清楚。

**关键词:** 新服务开发，概念模型，NSD，算法，组合。