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Overview about Service Labs worldwide:
Approaches, Methods and Use Cases to test Service across Lifecycle

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Abstract

As product-service systems are very complex, an integrated approach how to test a service is needed. The paper provides a framework for the development and testing of new services, and thereby grants a lot of space and tools for service innovation. In product-service-systems different types of resources are involved, for instance people, technology, information and organization. In the framework provided by mixed reality laboratory environments, all of these resources are brought together as well. The resources people, technology, information and organization are integrated. The interdisciplinary knowledge concerning these relevant resources is merged in the laboratory environments. Furthermore mixed reality laboratory environments are unifying academic expertise and practical, business-driven interests. Since service relevance in manufacturing companies is growing, the testing of new service concepts gets more important. Various methods are available, which help to verify service concepts. Due to this, the focus of this paper is on the analysis of established Service and Innovation Labs worldwide. To give an overview 24 Service labs are identified and analysed.

1. Servitization in manufacturing companies

Products in manufacturing are becoming more and more complex and differentiated. This trend represents huge growth opportunities for the service systems that accompany the products. Service systems hereby can be defined as dynamic configurations of resources that create and deliver value between providers and customers of services. Service innovation is a means to exploit the above mentioned opportunities.

An important part of it is the testing of service concepts which is – not like the testing of products – in the early stages. This is proven by the very rare service test laboratories and their lack of a broad spectrum of specific tools and methods which are explicitly suitable for testing service. Methods and tools used in such environments are identified and the possibilities to transfer these methods and tools to the topic of testing of services specifically in manufacturing companies

are discussed. This will not only push the development of the topic of Service Engineering, furthermore the results can be enhanced into the discipline of Service Operations Management and provide useful implications for managerial decisions. [1].

Servitization for manufacturing companies becomes more important in order to find new business opportunities and new customers [2,3,4]. Traditional product-centric sectors change step by step to being more service-centric, which is a grand challenge for every company, for their products, services and employees. This evolutionary process is often referred to as the servitization process for non-tertiary sectors. However, the servitization process is not just a change in the business model: it involves all the aspects of the enterprise, which therefore needs methodological and technical support concerning an integrated development and management of service offerings [2,5].

2. Service Lifecycle Management

Service Lifecycle Management is a part of Service Science, Management and Engineering (SSME) [3,5]. SSME is a young field of research that addresses the open questions and challenges coming from the servitization process. It covers all relevant aspects of a service economy and service business and hereby provides helpful input for research as well as industry. Furthermore SSME can be regarded as a new academic discipline and research area that complements many other disciplines or research fields by providing and contributing specific knowledge about service. [6]. Specialists agree that the foundation of a SSME-oriented economy has to be laid in the field of education, for example in companies with special trainings as well as in universities in special subjects of study or at least in special service subjects.

A Service Lifecycle Management creates a connection between Service Management [1,3,8] and Service Engineering [4,5,15,16,17]. The SLM topic is quite new and innovative. Nevertheless there are still some approaches, for instances the approach of Freitag [10, 12]. Here the Service Lifecycle Management framework consists of four parts:

- Phases of Service Life Cycle Management [10],

- Role Model for Service Life Cycle Management [12],

- Methods and Tools for Service Life Cycle Management,

- Interactions between product and service lifecycle management [9, 20].

The three main phases of the Service Lifecycle are service creation, service engineering and service operations management [10, 12]. An overview is given in Fig.1.
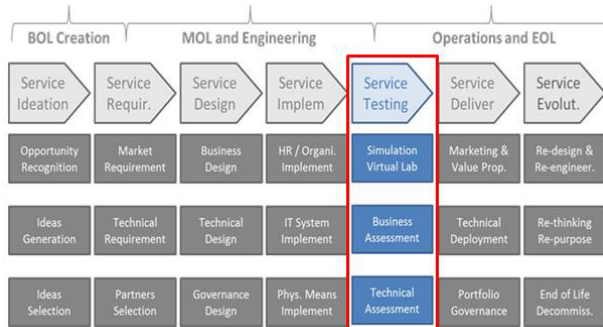

Fig.1. Service Lifecycle [10]

This paper focuses on the phase "Service Testing". A systematic testing phase before the market launch is crucial to assure a certain quality of new services. However, appropriate solutions, processes and methods seem to be missing [1]. The current business practice confirms that service testing tends to be neglected, even though several examples can be found of methods employed by a minority of companies to overcome this problem [1]. Examples there are:

- conceptual tests, where the consistency and plausibility of the service documentation is verified. Usually there is no interaction with real customers, the test is only theoretical.

- Usability and technology tests, here the question is whether or not the company's employees and customers are able to handle the new resources and if the new resources work properly for the associated purpose.

- Prototyping and simulation tests: This kind of tests focuses on the visualization of customer contact points. Interactions and processes are tested with real customers under realistic conditions, either in test branches or special virtual laboratory environments.

- Practical and pilot tests: In this case, the services concerned are offered to a limited number of customers (sometimes only to one customer), so that the company has a chance to adapt them if necessary prior to the general market launch. [11,13].

Still, though there is a broad range of methods for testing services, there are many deficits and unspecific procedures. These deficits are addressed by two solutions: first, a standardized test approach for service concepts and second, a test environment platform for prototyping customer contact points. [7].

Laboratory Environments offer a new approach to prototype and test services. Such platforms typically provide supportive techniques to act out a new service using a virtual reality (VR) environment, to evaluate the design of service environment ("servicescape"), to plan and test work organization methods and measures, to develop, demonstrate and communicate new concepts of interaction between service providers and service clients. This area of research is as already described very new but there are already some approaches for such a testing environment provided by several laboratories all over the world.

3. Challenges for testing a service

The challenges are based on a study carried out in 2014 about testing of services [14]. The study is based on 205 responses from directors of large and medium large enterprises from the manufacturing industry in Germany.

The result in Fig. 2 shows a strong need for suitable measure and tools, best practices and guidelines how to test services.