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Service Provision in the Framework of Industry 4.0

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Abstract

The purpose of this paper is to analyze the relevance of the industrial service industry in the framework of the project: „Industry 4.0“. In an increasing number of cases, the progress of the project is unsatisfactory and takes on a crisis-like character. Previous research in the context of the concept "Industry 4.0" focus on production environments. By conducting expert interviews, the relevance of services for the future project is examined. The result of the study is the identification of relevant business services, and an assessment of the applicability of scientific approaches to service-networks for the project "Industry 4.0". The current state of research in the field of Industry 4.0 and service network is used as a basis for this study. The added value of this study is to create a model to assess the service sector by bringing together different scientific approaches so as to meet the necessary interdisciplinary requirement. The decision model allows the service industry to apply the evaluation model for the own business view and strategy. The added value of the evaluation model is the application of service network models in the concept „Industry 4.0“ and the completion of the theoretical and practical implementation dimension in the concept.

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1. Introduction

More and more reviews and research conducted by industry-related institutes observe that the penetration and the progress of the concept of Industry 4.0 is very slow. In parallel, challenges to the industry increase very rapidly and competing concepts from other continents increasingly exert competitive pressure. These developments lead to an

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increasingly crisis-ridden character of the entire concept in Europe. China is after Germany the world's second largest exporter of products and systems of automation (Ohm, C., Bürger, M., 2015, p.17). Also, Carsten Knop reports of a study which states that labour productivity in Germany has not increased since 2007 (Knop, C., 2016). The German Chancellor Angela Merkel emphasized at CEBIT 2015 (Centrum für Büroautomation, Informationstechnologie und Telekommunikation) once again the importance of the "Platform Industry 4.0", which consist of large corporations, medium-sized enterprises, science, politics and industry associations VDMA (Verband Deutscher Maschinen- und Anlagenbau), ZVEI (Zentralverband Elektrotechnik- und Elektronikindustrie e.V.) and BITKOM (Bundesverband Informationswirtschaft, Telekommunikation und neue Medien e.V.). Looking at other continents there currently exist comparable collaborations such as the Industrial Internet Consortium (IIC), which are in direct competition in designing the digitization era with Europe (Merkel, A., 2015).

In recent years, the concept: "Industry 4.0" is gaining great importance in Europe. Current concepts and studies focus almost exclusively on the production of goods.

The keyword "Industry 4.0" means a development that changes the traditional industries fundamentally (Manhart, K., 2015).

The competitive situation German or European companies is affected by a growing dynamic. Increasing product and process complexity, volatile markets and increasingly shorter product, market, technology and innovation cycles are just a few examples of current and future challenges. The concept of "Industry 4.0" is seen as an important strategy to remain competitive in the future. This includes the design and implementation of competitive products and services, as well as the administrative powerful and flexible logistics and production systems (Kempf, D., 2014). Innovative interdisciplinary product development requires a rethinking of today's construction methods, processes, IT solutions and organizational forms. Designing and drafting methods in all disciplines should be reviewed and their suitability be checked for a modern, interdisciplinary approach model for product development and transferred to a common, integrated and interdisciplinary methods, process and IT solution (Eigner, M., 2013).

Industrial companies are currently facing the challenges of increasing individualization of products, the need to increase the resource efficiency and reducing time-to-market. These challenges they encounter in particular with increasing digitization, IT penetration and networking of products, manufacturing resources and processes. Concepts for this are currently often subsumed under the term Industry 4.0. (Lachenmaier, J., Lasi, H. and Kemper, H., 2015).

2. Theoretical base of the different research approaches

2.1. Industry 4.0

The Fraunhofer Institute published in 2013, the result of a study to "Industry 4.0". 661 companies, supplemented by 21 renowned experts in the industry, leading scientists and association and trade union representatives, participated in the study. There are three future-relevant themes were identified:

- Dealing with complexity;
- Capacity for innovation;
- Flexibility (Spath, D., 2013).

Thomas Bauernhansl emphasized at the conference "Mav Innovation Forum", that, due to the variety of technologies used, a further increased individualization and personalization of products and services, the "complexity" will explode in the future. With regard to the implementation of the "Industry 4.0" frame it is recommended to define so-called "use cases". (Bauernhansl, T., 2014).

In addition, the future project "Industry 4.0" supports the individualization of products at high flexibilised large-scale production and integration of customers and business partners in value creation processes. This allows completely new business models within a company and between companies. (BMBF 1, 2014).

The individual value-added steps can be networked with each other and can be used in synchrony. Due to the volatility of the markets, a flexible production will be supported, so as to timely respond to a permanent changing requirements (BMBF 2, 2014).

Some institutions are developing new standards to develop value chains for enterprises.

The "Verein deutscher Ingenieure" published in its status report in April 2014 some regulations. The definition contained therein implies that the product life cycle is increasingly geared to individual customer needs. The life

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