



DOTTORATO DI RICERCA IN TECHNOLOGY, INNOVATION AND MANAGEMENT (DTIM)



PHD PROFILE, II YEAR STUDENTS, A.A. 2018/2019

- **Name:** *Michela Giuseppina Zambetti*
- **Affiliation:** *Università degli Studi di Bergamo; Department of Management, Information and Production Engineering*
- **Contacts:** *Email: michela.zambetti@unibg.it
Phone : + 39 035 205 2005*
- **Title of the research:** *“A data-driven approach to Product Service System (PSS) engineering: explore the potential of data availability and its impact on PSS ecosystem”*
- **Tutor:** *Prof. Roberto Pinto*

OUTLINE OF THE RESEARCH

The concept that manufactures need to leverage innovative combinations of services and products to increase the scope of their value creation activities and to face the increasing global competition is not new. In fact, there is a rich literature on this trend, which has been mainly discussed under the terms “Servitization” and “Product Service System” (PSS). Nevertheless, the advancements in the technologies that allow obtaining real-time data from the environment and act upon this to control, monitor and interact with the real world is supporting and revolutionizing the “Servitisation” trend. In this regards, Information and Communication Technologies (ICT), Internet of things (IoT), cloud computing, data analytics, and the possibility to integrate information along the value chain in real-time, are the most relevant technologies. The adoption of these digital technologies is a key enabler for the provision of many services related to an integrated solution, either i) supporting new functionality, ii) providing the possibility to offer “Smart Services” or iii) increasing the efficiency of service delivery. Additionally, the adoption of an intelligent ICT infrastructure enables gathering feedback and data collection from later stages back to the earlier stages of the product lifecycle and creates the potential to enhance the value co-creation process, which is one of the central premises of the service logic.

However, one main concern is that data alone does not create competitive advantage, most of all in the service system context, where the intrinsic purpose is delivering value-in-use to customers, satisfy specific user needs, and build long-term value of the relationship, rather than performing short term transaction, which can be also easily supported by automated information system. The impact that data availability can create has not been deeply investigated yet. Research dealing with this specific topic is scant and it is at its beginning: there are some exploratory studies on the increasing importance of information as a source of value in the service context but understanding the role of information compared to products and services in enabling servitization is still limited and opens several possibilities for my studies. Indeed, in this context, **my research aims at developing a comprehensive, in-depth knowledge and understanding of the value of data availability (enabled by Industry 4.0 technologies such as big data analytics, cloud computing and IoT) in the context of PSS. Further, the research will investigate how the application of analytics tool can affect the SE process, the definition of the PSS offering, and, as a consequence, the entire PSS ecosystem.**



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My Ph.D research studies also benefits of the collaboration of an international company: ABB, where I am involved in the context of the ABB Ability project, which includes all the initiatives aimed at offering digital solutions and services, based on connected products and data collection, through a unique platform.

Specifically, I am in the business unit which produces circuit breakers where we are integrating connectivity capabilities into products to offer clients cloud-based services on energy and asset management. What we are trying to do now, is demonstrate the benefits related to the adoption of this kind of solution and understand which are the valuable services that can be offered based on data gathered.

In this view, the main expected outcome is the successful realization of the industrial case study, which imply reach the ability to i) define relevant data, ii) create the condition to gather data and effectively manage the exchange of information, iii) exploit such data adequately and iv) define ways to actively use them in the service engineering process and finally iv) defining new service offering.

Overall the main contribution of this research will be the definition of a reference framework and related methods regarding how to move from data acquisition to information and knowledge generation, in order to create value for the company, the ecosystem, and the customers in a value co-creation setting. Further, the research aims at exploring how this information, bundled with analytical tools, can provide insight into the service engineering (SE) process.

The research perfectly fits into the PhD specific themes, since working with a theoretical and high-level approach in University and empirical applications in the industrial setting, enables me to understand how academic discoveries can fit into reality and to comprehend industrial needs, in a highly innovative and international environment, and from different perspectives. The activities and research I am performing are mainly focused on managerial considerations, which cover all the life-cycle steps of innovative products, process and service, from their beginning to the final deployment to the customers. Due to the high technological rate of the project I am involved, I also have a continuous view on all the technical aspects that have to be taken into account in such projects, that can vary from technological readiness, architectures development and feasibility of solutions. Furthermore, the topic under my analysis can be seen as the link between different areas, such as product development, service science, data analysis, computer and communication, energy efficiency. In order leverage synergies and pursue high level investigations I am actively working with persons who own those competences and new collaboration with researchers who are interested in the field are more than welcome.