Syllabus
BAE4194 Product Service Systems 2
Philipp Dörflinger, Prof. Dr. Bernhard Kölmel
Summer Semester 2022

Level	Bachelor	
Credits	3	
Student Contact Hours	2	
Workload	90 hours	
Prerequisites	At least 50 ECTS from section 1 of the study program, successful completion of PSS 1	
Time	s. LSF	
Room	s. LSF	
Start Date	s. LSF	
Lecturer(s)	**Name**	Philipp Dörflinger
	Office	N/A
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	Office Hours	On Appointment
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Summary

Product service systems (PSS) have been one major concern of research into sustainable consumption for more than ten years (e.g., Stahel, 1994, Goedkoop et al. 1999, Mont, 2004). Usually, PSS are divided into services providing added value to the product life cycle, such as maintenance and upgrading, services providing enabling platforms for customers, such as renting or leasing, and services providing final results to the customers, such as mobility services or warmth delivery (UNEP, 2002, p. 8f.). Given the offer of products, which are losing their competitive value, companies begin to seek solutions to improve their market position through the inclusion of services. The development of product-service systems (PSS) is a solution that has been discussed by the academia in recent years, resulting in an increasing number of publications. The real situation identified in the existing literature on PSS presents basic characteristics of a PSS, it contains its four main factors: product, service, actors network and infrastructure and presents the similarity of the three types of PSS (product-oriented, use-oriented and results-oriented).

Real-life examples or potential services are taken into account. E.g. the vision of the "Smart City 5.0" concept as an ecosystem of smart services based on multi-agent technology is presented. It is characterized by the cooperation of Artificial Intelligence systems and humans, and can harmoniously balance all spheres of life and contradictory interests of different city actors. In this concept, each smart service is presented by an autonomous agent. They can compete or cooperate with each other through a service bus and interact both vertically and horizontally on the basis of specialized protocols. Top-level services can be constructed as autonomous multi-agent systems of a lower level, where an agent can recursively reveal a new service for itself. The overall objective is to develop knowledge and understanding of scientific research methods and to provide skills to design and accomplish a research project in the domain of product service systems. Goal is to understand the role of product/service strategy, its elements and their interdependences.

Outline of the Course

The growing importance of combining products and services (product-service systems, PSS) brings about the need for significant changes in the development processes of companies. The design and implementation of solutions, the so-called product service systems (PSS), takes place in an extended value network consisting of production and service networks of the manufacturer in cooperation with the customer. The companies, thus, face a medium-term challenge to complete the strategic transformation from proper product-oriented manufacturer to customer-oriented full-service providers. The explosive growth of Smart City and Internet of Things applications creates many scientific and engineering challenges that call for ingenious research efforts from both academia and industry, especially for the development of efficient, scalable, and reliable Smart City services

Course topics:

- Real-life case
- Current System Analysis
  Unterstand better your organisation and current business model as well as market strength and weaknesses
- PSS Design
  Find new service opportunities and build up a concrete idea
- PSS Implementation and Operation
  Know what factors are critical to lead the idea to a success while avoiding the pitfalls

Course Intended Learning Outcomes and their Contribution to Program Intended Learning Outcomes / Program Goals

	Learning Objective	Contribution
6.1	Students show that they are able to work successfully in a team by performing practical tasks.	Students are able to jointly work on a capstone project within a multifaceted assignment that serves as a culminating academic and intellectual experience.

Teaching and Learning Approach
Participants will produce a Products Service Project by creating specific applications of the strategies introduced in the course, participants will also use different tools and technologies for each strategy. The Project and presentation are due the last week of classes.

Literature and Course Materials
- Petri Helo, Angappa Gunasekaran, Anna Rymaszewska, Designing and Managing
- Industrial Product-Service Systems, Springer 2017
- Vogel-Heuser, B., Lindemann, U. und Reinhart, G. (2014): Innovationsprozesse zyklenori-entiert managen: Verzahnte Entwicklung von Produkt-Service Systemen. Vieweg+Teubner: Berlin, Heidelberg.
- Mannweiler, C., Aurich, J.C. und Clement, M.H. (2010): Produkt-Service Systeme: Gestal-tung und Realisierung. Springer: Berlin, Heidelberg.
- Spiller, M. et al. (2013): Dienstleistungsmodellierung: Product-Service Systems und Pro-duktivität. Gabler: Wiesbaden.

- Class handouts will be available in the LMS.

Assessment
Basically, the following requirements will be graded each separately, and on that basis an average grade per person will be built by the lecturer:
- Active general participation during lectures, and
- especially in brainstormings, workshops, and case studies.
- Individual roles prepared and actively performed in group(s) during workshops and case studies, as defined by and agreed with the lecturer.
- Individual or group voluntary activities/ presentations, as required by or agreed with the lec-turer – as far as reasonably possible.

Maximum 2 lectures (90 minutes each) missed during the course. More absence must be agreed with the lecturer and be compensated.

Grading, based on exam results:
'Sehr gut' represents exceptional work, far above average.
'Gut' represents good work, above average.
'Befriedigend' represents average work.
'Ausreichend' represents below average work with considerable shortcomings.
‚Mangelhaft' is just exceptional work in the wrong direction or with unacceptable shortcomings

Schedule

Date	Theme:
Lecture 1&2	Topic Introduction
Lecture 3&4	Interaction and project planning
Lecture 5,6 &7	Highlighting a research project
Lecture 8-14	Research Project Presentations

Tentative Schedule (changes tba)

Academic Integrity and Student Responsibility
N/A

Code of Conduct for Students
Link to the Code of Conduct for online Teaching

Teaching Philosophy
In the classes we consider the important concepts, models, principles and phases of strategic and operational management and apply them on a real world situation. I will assist you to develop a self-contained strategic thinking, based on the acquired basic skills, and to evaluate the opportunities and the threats of different strategies and management methods. When you don't understand a learning step, you should pose a question during the lesson. I want to support every student who is committed to take the required knowledge and to pass the exams successfully.

Additional Information

Further details to be announced via e-learning (sign in and check regularly)

Language: English