Module Description, available in: EN

Smart services

General Information

Number of ECTS Credits

3

Module code

CM_SmartSer

Valid for academic year

2025-26

Last modification

2024-10-08

Coordinator of the module

Jürg Meierhofer (ZHAW, meeo@zhaw.ch)

Explanations regarding the language definitions for each location:

- Instruction is given in the language defined below for each location/each time the module is held.
- Documentation is available in the languages defined below. Where documents are in several languages, the percentage distribution is shown (100% = all the documentation).
- The examination is available 100% in the languages shown for each location/each time it is held.

	Lausanne			Lugano	Zurich		
Instruction					**X** E 100%		
Documentation					**X** E 100%		
Examination					**X** E 100%		

Module Category

CM Context module

Profile Recommendations

This module is recommended for the following profiles:

	Zurich
Profile	BE, DS

Lessons

2 lecture periods and 1 tutorial period per week

Entry level competences

Prerequisites, previous knowledge

Prior to joining the module, the students should have an understanding of business process modeling and engineering, e.g., terms like process charts, swimlanes, process models, resources, value chain etc. (see, e.g., the paper of John Krogstie: Introduction to Business Processes and Business Process Modeling, https://link.springer.com/chapter/10.1007/978-3-319-42512-2_1)

Brief course description of module objectives and content

Smart Service Design and Engineering - Value Creation:

- Basics of Smart Service Design (Customer insight, customer journey, value proposition design, use of data insights)
- Selected topics of Service Science and Service Dominant Logic
- Service blueprinting as a relevant step in the service engineering process
- Characteristics of Data Services and Data Products
- Use of data in the smart service design process and in the services themselves - Smart Data
- data sources
- Iterative improvement up to product maturity
- Discussion of applications in the industrial and the sector
- Discussion of real-life cases

Smart Business Model Design - Value Capturing:

- Fundamentals for Engineering Value Flows in Service Ecosystems and Service Business Models
- From Service Blueprint to Business Model
- Quantification of service business models
- Basics Business Model Design and Business Model Canvas
- Service Ecosystem Design
- Quantification of the business model
- Discussion of real-life cases

Data Protection, Data Security, Data Ethics:

- Fundamentals of data protection and data security
- Relevant aspects for Data Product Design
- Legal aspects vs. ethics
- Discussion of real-life cases

Aims, content, methods

Learning objectives and competencies to be acquired

- Understand and apply the essential principles of Smart Service Design and Engineering - i.e. the development of intelligent services on the basis of data (comprehensive methods for the development of novel data-driven services, for their operation as well as their improvement in operations).
- Able to integrate the data specific aspects into their service design.
- Apply the methods of data-driven service engineering in practical case studies primarily in industrial envi-ronments (B2B), but also in consumer areas (B2C)
- Know and understand the relevant basics of Service Business Model Design including the types of industrial Service Models.
- Evaluate these business models quantitatively. To weigh up variants and draw conclusions about the engineering process with the aim of achieving an opera-tionally and economically balanced model.
- Understand the design of service ecosystems.
- Able to understand the essential principles of data protection, data security, and data ethics.

Module content with weighting of different components

Smart Service Design and Engineering - Value Creation: 40%
Smart Business Model Design - Value Capturing: 40%
Data Protection, Data Security, Data Ethics: 20%

Teaching and learning methods

- Lectures
- Group work, presentation and discussion of case studies
- Self study of papers and analysis of business case studies

Literature

- A. Wierse, T. Riedel: Smart Data Analytics, Walter de Gruyter, 2017.
- A. Polaine, L. Løvlie, B. Reason, Service Design: From Insight to Implementation, Rosenfeld, 2013.
- A. Osterwalder, Y. Pigneur et al., Value Proposition Design: How to Create Products and Services Customers Want, Wiley, 2014.
- E. Siegel, Predictive Analytics: The Power to Predict Who Will Click, Buy, Lie, or Die, Wiley, 2016.
- F. Provost, T. Fawcett, Data Science for Business: What you need to know about data mining and data-analytic thinking, O'Reilly, 2013.
- A. Osterwalder, Y. Pigneur, Business Model Generation, Wiley, 2010.

- C. Kowalkowski, W. Ulaga: Service strategy in action: a practical guide for growing your B2B service and solution business, Service Strategy Press, 2017.
- O. Gassmann, K. Frankenberger, M. Csik: Business Model Navigator: 55 Models That Will Revolutionise Your Business, Harlow Pearson, 2014.
- D. S. Evans, R. Schmalensee, Matchmakers, Matchmakers: The New Economics of Multisided Platforms, Harvard Business Review Press, 2016.
- W. Stallings, Cryptography and Network Security: Principles and Practice (7th Edition), Pearson, 2016.
- N. Passadelis et al., Datenschutzrecht, Beraten in Privatwirtschaft und öffentlicher Verwaltung, Basel 2015.
- Stickdorn, Marc, Markus Edgar Hormess, Adam Lawrence, and Jakob Schneider 2018: This Is Service Design Doing: Applying Service Design Thinking in the Real World. O'Reilly Media, Inc.

Assessment

Additional performance assessment during the semester

The module does not contain an additional performance assessment during the semester

Basic principle for exams

As a rule, all standard final exams are conducted in written form. For resit exams, lecturers will communicate the exam format (written/oral) together with the exam schedule.

Standard final exam for a module and written resit exam

Kind of exam

Written exam

Duration of exam

120 minutes

Permissible aids

Aids permitted as specified below:

Permissible electronic aids

- open book, all materials including PC, laptop, tablets etc. allowed
- during the exam session, any telecommunication (network, wifi, bluetooth, wlan etc.) and the respective programs/apps for communications must be turned off

Other permissible aids

No other aids permitted

Exception: In case of an electronic Moodle exam, adjustments to the permissible aids may occur. Lecturers will announce the final permissible aids prior to the exam session.

Special case: Resit exam as oral exam

Kind of exam

Oral exam

Duration of exam

30 minutes

Permissible aids

Aids permitted as specified below:

Permissible electronic aids

- open book, all materials including PC, laptop, tablets etc. allowed
- during the exam session, any telecommunication (network, wifi, bluetooth, wlan etc.) and the respective programs/apps for communications must be turned off

Other permissible aids

No other aids permitted