Reference Syllabi

Association for Information Systems (AIS)

Service Engineering and Management
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Background

Services dominate western economies, accounting for about 70% of employment and gross value added. Moreover, services are the only part of western economies to have expanded in terms of employment in recent years, as manufacturing, mining and agriculture continue to contract. Most of service innovation today is about the adoption and effective implementation of IT, as IT changes services in three ways: first, the use of IT contributes by enabling faster and more structured development processes; second, new services offerings arise by applying and integrating IT; third, IT leverages industrialization potentials for services such as standardization, automation or new ways of customer integration. Guided by a value proposition, service systems enable value co-creation through configuration of actors (human and non-human) and resources (including technology, information, and physical artifacts), therefore constituting highly complex socio-technical systems. In recent years, service emerged into a key concept in information systems (IS). By emphasizing a systems perspective on services, this allows addressing the connectedness and complementarity of constituting elements in enabling the co-creation of value. Essential to the successful development of services is that they are underlined by a reasonable service process and design. Service Engineering is defined as the systematic design and development of services by deploying engineering methods, practices, and tools.

Purposes and Objectives

Developing and marketing services hence is a crucial success factor for most enterprises in recent times. In order to leverage these opportunities, competences in service engineering and management become inevitable. This course covers fundamentals, central processes and methods as well as examples of usage for systematic design and development of new (IT-based) service offerings (service engineering) as well as their management and provision (service management).

By end of the course, participants...
- know theoretical basics of services and IT-based service offerings
- understand the phenomena of „servitization“ and „service economy“ and can explain the economical challenges arising for companies of different branches
- can explain, how IT changes and modifies services and which new offerings and potentials arise through integrating IT
- know fundamentals of IT-service management, exemplified in ITIL
know tasks and responsibilities of service engineering for the systematic development of service offerings, as well as potentials and benefits
- can apply different process models for service development, including structuring and planning of such development
- are familiar with the most common methods and techniques of service engineering and management
- can apply selected methods and techniques, in particular methods for service modeling
- can identify the essential management tasks within the lifecycle of (IT)-services, structure these tasks and apply this to exemplar cases
- can assess service engineering methods on their suitability to address the challenges in service development projects

We recommend dividing the course in two parts – teaching theoretical foundations and concepts in class as first part, followed by a running case where participants apply the methods and concepts taught to a service development project as second part. We usually have a session 4 to 5 full days in the beginning of the semester to build up the necessary theoretical foundations. After this session, depending on the size of the course, individual or group assignments are given that need to be completed during the semester. The assignments should be interlocked with the teaching units. The assignments of the running case are thus (1) a rough service idea, (2) a business model canvas specifying the idea, (3) service prototypes to illustrate the idea, (4) a service process model, (5) a service operations model, and (6) a service scorecard that guides service operations by performance goals. Depending on the course design, a second round of iteration is recommended. The course has been run successfully as boot camp (6 days, content and class in the morning, group work in the afternoon), followed by a more in-depth iteration of the running case (about 6 weeks, where participants can revise and refine their running case). Alternatively, the course can also be taught on a weekly basis, where one unit is taught each week, followed by the corresponding assignment. The more time participants have for the running case, the more they can spend on evaluation and real-world testing of their service ideas. It is further possible to include real-world projects or business partners. This combination of teaching and application in real world settings fosters participants’ motivation and learning outcomes. As additional option, reading assignments or teaching cases can complement the course.

Structure

INTRODUCTION – DIGITIZATION, SERVITIZATION, SERVICE DOMINANT LOGIC, PRODUCT SERVICE SYSTEMS

Overview

The first section motivates the importance of services and introduces fundamental theories and concepts. The section provides an introduction to service engineering and management and explains the concepts of servitization, product service systems and service dominant logic. We recommend to enrich this section with multiple examples and discussions. For participants, it is important to understand that service thinking is not limited to classical service industries. Enabled by IT and digitization, almost all industries undergo changes and adapt a service dominant logic. Additionally, participants should recognize that this transformation affects almost every part of organizations, e.g. research and development, operations, sales, marketing, etc. Also, the role of IT as main driving force behind this phenomenon should be highlighted.

Learning Outcomes

After the unit participants are able to
- share the fascination for services
- explain the increasing importance of the service sector and describe the driving forces behind this development
- explain the concepts of service, product service systems, servitization and service dominant logic as well as the corresponding challenges industries are facing
- demonstrate how digitalization and IT transform industries and are the driving force behind servitization
provide examples how value creation and domain boundaries are changing by increased servitization

Material

- Alter S (2012) Metamodel for service analysis and design based on an operational view of service and service systems. Service Science 4:218–235
- For German-speaking classes this textbook can be used:

SERVICE INNOVATION AND ENGINEERING

Overview

The second section introduces necessities and challenges for the systematic development and design of new service offerings. It provides an introduction to innovation theories for services, followed by fundamental concepts and theories of service engineering. The central role of service strategies is presented, followed by the business model canvas. Particularities of service innovations and digitization should be included and explained. Engineering thinking, i.e. systematically, repeatable and projectable development of innovations is introduced. Further, different process models that structure a systematic and repeatable service innovation process are introduced, allowing participants to outline service development processes themselves. The life-cycle perspective for service innovations will be highlighted, especially dependencies between service engineering and service management. Participants will understand that development and operations are not separate disciplines, but rather should influence and fertilize each other. Towards the end of the session, concepts for involving customers into service engineering, e.g. via open innovation, are presented and their benefit will be discussed.

Learning Outcomes

After the unit participants are able to
- outline strategies for service businesses and corresponding business model
- illustrate characteristics and challenges for the design of service innovations
- explain the role of service engineering
- discuss the potentials and risks of systematic development of service offerings
- explain the most common process models for service engineering
- outline a timeline and framework for a service engineering process
- describe the concept of open innovation for services
- exemplify the benefits of customer integration in different phases of service engineering
SERVICE DESIGN

Overview

This section presents an introduction into service design. Service design is a form of conceptual design which involves the activity of planning and organizing people, infrastructure, communication and material components of a service in order to improve its quality and the interaction between service provider and customers. The purpose of service design methodologies is to design back and front office of services according to the needs of customers and the competences/capabilities of service providers, so that the service is user-friendly, competitive and relevant to the customers, while being sustainable for the service provider. For this purpose service design uses methods and tools derived from different disciplines. The section introduces the fundamentals of service design and design thinking, as well as different techniques and methods. Focus are on creativity techniques, evaluation methods and prototyping. Depending on the overall scope of the course, this section can be enhanced greatly by presenting several methods and exercising them in class.

Learning Outcomes

After the unit participants are able to
- explain the basic concepts and theoretical foundations of service design
- apply creativity techniques for service design and development
- assess and select different methods for evaluation within service design
- explain and apply prototyping in the context of service design
- apply the presented service design methods and techniques

Material


For German-speaking classes this textbook can be used:
SERVICE MODELLING

Overview

Services delivery can generally be regarded as processes. Service modeling is the activity of representing processes of the service delivery, so that the current process may be analyzed or improved. The objective is often to increase process speed or reduce cycle time; to increase quality; or to reduce costs, such as labor, materials, scrap, or capital costs. This section provides an introduction to the role of modeling methods for service engineering. Emphasis is put on potentials and the danger of over-emphasizing modeling efforts, as well as on the role of modeling as a socio-technical process. The Service Blueprint as well as the Business Process Modeling Notation (BPMN) is introduced as modeling language. Additionally, Quality Function Deployment (QFD) and Failure Mode Effects Analysis (FMEA) can be applied to service models to improve efficiency.

Learning Outcomes

After the unit participants are able to

- understand services being processes
- explain the value of service modeling for service engineering and management
- design process models with service blueprint
- design process models with BPMN
- explain role and function of process engines and Business Process Management Suites
- explain the foundations of QFD and FMEA for services

Material

- For German-speaking classes this textbook can be used:
SERVICE OPERATIONS

Overview

This section focuses on service management and its particularities. Service operations refers to the entirety of activities – directed by policies, organized and structured in processes and supporting procedures – that are performed by an organization or part of an organization to plan, deliver, operate and control services offered to customers. It is concerned with meeting the needs of customers, and has the objective to design an appropriate mix of people, process and information technology to meet customer needs and business goals. The first part of the section presents challenges within service management, lying a focus on selected strategies and methods and techniques from demand management and revenue management. The second part presents IT service management. IT services represent a specific class of services – being pioneer in standardization or service factory. Therefore, ITIL as reference model for IT-service management is introduced, leading to discussions of transferability of those concepts to other services.

Learning Outcomes

After the unit participants are able to
- name foundations, central tasks and principles of IT service management
- describe the importance, objectives and central processes of the ITSM reference model ITIL
- describe and exemplify tasks and challenges of service management
- name most important strategies for demand management
- apply selected methods for demand management to examples

Material


For German-speaking classes this textbook can be used:

SERVICE QUALITY AND PERFORMANCE MANAGEMENT

Overview

Service quality is a comparison of customer expectations with performance. A business with high service quality will meet customer needs whilst remaining economically competitive. Improved service quality may increase economic competitiveness. This aim may be achieved by understanding and improving operational processes, identifying problems quickly and systematically establishing valid and reliable service performance...
measures and measuring customer satisfaction and other performance outcomes. This section describes particularities and challenges when assessing service quality. Further, different methods and techniques, e.g. the GAP Model or Kano are introduced. Performance management extends this notion and includes activities which ensure that goals are consistently being met in an effective and efficient manner. Performance management can focus on the performance of an organization, a department, employee, or even the processes to build a service. It can be understood as a process by which organizations align their resources, systems and employees to strategic objectives and priorities. This section introduces fundamentals on performance management for services and exemplifies this by the service scorecard.

**Learning Outcomes**

After the unit participants are able to
- identify problems in perception and measurement of service quality
- analyse customer perception and service quality by using the GAP model
- describe specifics of IT-based service offerings in regard to service quality
- apply measurement techniques for service quality
- describe goals and foundations of performance management
- apply service scorecard and benchmarking for services

**Material**

- For German-speaking classes this textbook can be used:

**Recommended Citation**