“Current Topics in Service Operations Management Research”

General Information:

1. The goal of this seminar is to introduce participants to conducting scientific research. It thereby prepares students for writing their M.Sc./diploma thesis. The seminar is geared towards students intending to write their thesis at the Chair of Service Operations Management.

2. Each participant will explore one of the research topics listed below – based on the fundamental literature provided. Each participant presents his/her findings in a written report (about 20 pages) as well as in an in-class presentation (20 min + 10 min discussion).

3. Each participant also acts as a discussant for one of the other presentations. The discussant is responsible for critically assessing the presented work and for opening the ensuing discussion.

4. A kick-off meeting for all participants will be held on May 25th, 2016 at 10:15pm in SO318. During this meeting, general guidelines for conducting scientific work will be discussed.

5. The written reports have to be submitted electronically on CD and as a hard copy in two-fold by October 31st, 2016.

6. Student presentations will be held on November 9th and/or November 16th, 2016 (exact dates and times tba). Attendance is mandatory. Presentation slides have to be submitted one day before the first presentation day – no changes allowed afterwards.

7. The final grade for the seminar is composed of the following components: Written report (60%), presentation (30%), contribution to discussion (10%).

8. The report and the presentations can be delivered either in English or in German.

9. The application procedure for this seminar is combined with those for the seminars of the Chair of Production Management (OPM 761), the Chair of Logistics (OPM 701) and the Chair of Procurement (OPM 791). Students can apply for topics from all chairs by completing the online form. Topics labeled with “L” refer to the Chair of Logistics (OPM 701), topics labeled with “P” refer to the Chair of Production Management (OPM 761), topics labeled with “B” refer to the Chair of Procurement and topics labeled with “S” refer to the Chair of Service Operations Management (OPM 781). Applicants for OPM 781 must in addition send a CV and official grades overview by e-mail to soma@mail.uni-mannheim.de with subject “OPM 781 Seminar Application”. Application deadline is May 16th, 2016.

10. Admission to the seminar is binding and will be confirmed by e-mail on May 23rd, 2016.

11. For questions concerning the seminar contact us by email at soma@mail.uni-mannheim.de.
Seminar topics

**Topic S01: State-of-the-Art Approaches for Railway Revenue Management**

Railway revenue management is concerned with optimal pricing and allocation of seat capacity in a railway network. Compared to airline revenue management, railway RM has received less attention in the literature although it is highly relevant in practice. In this seminar paper, a literature review on optimization models in railway RM should be provided including a useful classification. Based on the review future research opportunities should be identified.

**Basic Literature**


**Topic S02: Creating Robust Railway Timetables – a Literature Survey**

The train timetabling problem (TTP) consists of finding a train schedule on a railway network that satisfies some operational constraints and maximizes some profit function that accounts for the efficiency of the infrastructure usage. In practical cases, however, the maximization of the objective function is not enough, and one calls for a robust solution that is capable of absorbing, as much as possible, delays/disturbances on the network. The objective of the seminar is to review and classify the scientific literature on robust railway timetable generation and reveal opportunities for future research.

**Basic Literature**


**Topic S03: Optimal Design of Co-productive Services**

In services, customers provide significant inputs into the production process. In particular, these inputs may be the customers themselves participating in the service delivery. Although many service firms have explored different ways of involving customers in their production process, there is no clear guideline for the design of such coproductive systems. The goal of this thesis is to provide a literature overview on normative models that provide decision support for service providers regarding how to design its coproductive services. Furthermore, the approach of Roels (2014) should be discussed in more detail and future research opportunities should be identified.
Basic Literature


**Topic S04: Is Leasing Greener than Selling?**

Based on the proposition that leasing is environmentally superior to selling, some firms have adopted a leasing strategy and others promote their existing leasing programs as environmentally superior to “green” their image. The argument is that because a leasing firm retains ownership of the off-lease units, it has an incentive to remarket them or invest in designing a more durable product, resulting in a lower volume of new production and disposal. However, leasing might be environmentally inferior because of the direct control the firm has over the off-lease products, which may prompt the firm to remove them from the market to avoid cannibalizing the demand for new products. Motivated by these issues, Agrawal et al. (2012) adopt a life-cycle environmental impact perspective and analytically investigate if leasing can be both more profitable and have a lower total environmental impact. The objective of the thesis is to review their approach theoretically and by an example, discuss implications, limitations and future research opportunities. Related literature should be reviewed in order to assess the contribution of the Agrawal et al. (2012).

Basic Literature


**Topic S05: Performance Measures of Jackson Networks**

Jackson networks are a type of queuing networks in which every node represents a queue. A finite population of jobs route from one node to another following a fixed routing matrix and service time distribution. Output of a node is the input for a subsequent node in the route.

The aim of the thesis is to study Jackson networks with a focus on related performance measures. Expected waiting time in the queue, expected number of jobs waiting in the queue and utilization of server are examples of performance measures.

Basic Literature


**Topic S06: Railway scheduling – Passenger behavior in delay scenarios**

A current topic in railway scheduling is Delay Management. Classical Delay Management focuses on the decision whether a connecting train should wait for a delayed feeder train or not. A decision therefore is made by determining which alternative causes less delay. Kanai et al. (2011) look at this problem from a different perspective. They present an algorithm which tries to take a decision by measuring passenger dissatisfaction. The thesis should explain how this approach and the underlying methods work.

**Basic Literature**


**Topic S07: Optimization as a Tool for Service Design**

When designing products, optimization is a commonly used technique to align customer needs with the actual product offered by the company. Over the past decades researches proposed various models that integrate different aspects in this decision process. When the research focus shifted from production to services, research on optimization models also expanded to services.

Thus, literature on optimization of service offering can be categorized into (1) pure service models, (2) models for both products and services, and (3) product models that might be applicable to services through slight modifications. This seminar thesis should present models for each of the aforementioned categories and explain to underlying theory.

Topic S08: Optimal Process Design

Every company that is offering products or services needs to manage the underlying processes. On the one side a graphical visualization can help to understand the complex process architecture, find problems or errors in the design, and communicate the offering to other people inside or outside the company. On the other side techniques like optimization might help to align the right process configuration with customer expectations. While literature on the first mentioned technique is widespread, only a few optimization models consider processes at least to some extent.

The following thesis should present an overview of different alternatives to improve or optimize a company’s offering. Each alternative should be evaluated regarding its applicability to products and services. A special priority should be set on the integration of processes in optimization models. Because no tool is able to properly consider processes yet, those tools that consider processes at least to some extent should be critically reviewed.


Topic S09: Agent-Based Modelling vs. Discrete-Event-Simulation

Simulation is an effective technique to analyze and optimize processes. Originally used in a production context, it has later been adapted to services. Depending on the context and goal of the respective simulation, different approaches might be used. Beside discrete-event simulation and the system-dynamic approach, agent-based modelling accounts for the latest development. While classical forms like discrete-event simulation neglect the distinctiveness of any individual, agent-based modelling is challenging this perspective since its development ten years ago.

The goal of this seminar thesis is to offer a comprehensive understanding on agent-based modelling and discrete-event-simulation and compare both tools regarding strengths, weaknesses, and applicability in different industries or contexts. The major value of this thesis will be added through an application example. By implementing the same service process in Anylogic both through discrete-event-simulation and agent-based modelling, a direct comparison can be achieved.

Conjoint analysis is a powerful tool to predict customers’ buying behavior. Based on expected utilities, it allows to design products or services according to the customer needs. While this customer perspective is very important, the company perspective should also be taken into consideration. One possibility is to take the survey data and integrate it into an optimization model.

This seminar thesis is intended to provide an overview of conjoint analysis in the context of service operations. Key questions are: In which industries and for which scenarios has conjoint analysis already been applied in services? What was the respective context and how did the author align the customer data with the company’s processes? The thesis will conclude with an outlook on the future benefit of conjoint analysis in service operations.