

Hand-out MSc Seminar on Operations Management: Applications of system dynamics in various industries

Winter term 2020/21, version: 01 September 2020

Please note: This document reflects our planning before the term started; it will **not** be updated regularly. For short-term changes regarding rooms or times, see Campus. Changes regarding the content will be discussed in class and, if appropriate, communicated via Ilias.

Learning objectives

After successfully finishing the course, students can:

- independently understand a scientific paper;
- summarize and criticize a scientific paper;
- put a scientific paper into context with regard to broader discussions in the field of (operations) management;
- rebuild and moderately extend the simulation model described in the paper;
- give an academic presentation.

Content

The seminar asks students to independently acquire knowledge based on a scientific paper. This paper has to be understood, summarized, criticized, extended and put into context. Students hold a presentation about their understanding and findings.

Requirements

Course “Supply Chain Dynamics” successfully passed.

Literature

Students are requested to choose one scientific article from the following list, on which their seminar paper and presentation will be based:

1. Ahmad, S., & Simonovic, S. P. (2000). System dynamics modeling of reservoir operations for flood management. *Journal of computing in civil engineering*, 14(3), 190-198.
2. Gonçalves, P. (2011). System dynamics modeling of humanitarian relief operations. Now titled Balancing Provision of Relief and Recovery with Capacity Building in Humanitarian Operations. *Operations Management Research*, 4(1-2), 39-50.
3. Thompson, B. P., & Bank, L. C. (2010). Use of system dynamics as a decision-making tool in building design and operation. *Building and Environment*, 45(4), 1006-1015.

4. Coyle, R. G., & Gardiner, P. A. (1991). A system dynamics model of submarine operations and maintenance schedules. *Journal of the Operational Research Society*, 42(6), 453-462.
5. Cagliano, A. C., DeMarco, A., Rafele, C., & Volpe, S. (2011). Using system dynamics in warehouse management: a fast-fashion case study. *Journal of Manufacturing Technology Management*.
6. Wolstenholme, E. F. (1988). Defence operational analysis using system dynamics. *European journal of operational research*, 34(1), 10-18.
7. Yang, T., Li, Y., & Zhou, S. (2019). System Dynamics Modeling of Dockless Bike-Sharing Program Operations: A Case Study of Mobike in Beijing, China. *Sustainability*, 11(6), 1601.
8. Aschauer, G., Gronalt, M., & Mandl, C. (2015). Modelling interrelationships between logistics and transportation operations—a system dynamics approach. *Management Research Review*.
9. Coyle, J. M., Exelby, D., & Holt, J. (1999). System dynamics in defence analysis: some case studies. *Journal of the Operational Research Society*, 50(4), 372-382.
10. Georgiadis, P., & Besiou, M. (2008). Sustainability in electrical and electronic equipment closed-loop supply chains: a system dynamics approach. *Journal of cleaner production*, 16(15), 1665-1678.
11. Liu, P., Lin, B., Wu, X., & Zhou, H. (2019). Bridging energy performance gaps of green office buildings via more targeted operations management: A system dynamics approach. *Journal of environmental management*, 238, 64-71.
12. Cheng, J. K., Tahar, R. M., & Ang, C. L. (2011). A system dynamics approach to operational and strategic planning of a container terminal. *International Journal of Logistics Systems and Management*, 10(4), 420-436.
13. Georgiadis, P., & Michaloudis, C. (2012). Real-time production planning and control system for job-shop manufacturing: A system dynamics analysis. *European Journal of Operational Research*, 216(1), 94-104.
14. Choi, D., Noh, Y., & Rha, J. S. (2019). Work pressure and burnout effects on emergency room operations: a system dynamics simulation approach. *Service Business*, 13(3), 433-456.
15. Shin, N., Kwag, T., Park, S., & Kim, Y. H. (2017). Effects of operational decisions on the diffusion of epidemic disease: a system dynamics modeling of the MERS-CoV outbreak in South Korea. *Journal of theoretical biology*, 421, 39-50.
16. Walters, J. P., Archer, D. W., Sassenrath, G. F., Hendrickson, J. R., Hanson, J. D., Halloran, J. M., ... & Alarcon, V. J. (2016). Exploring agricultural production systems and their fundamental components with system dynamics modelling. *Ecological modelling*, 333, 51-65.

Timetable

Date, time	Topic	Where?
05/11/2020, 11:30–13:00	Kick-off: explanation of procedures and topics	Online
19/11/2020, 11:30–13:00	Organized peer-review of table of contents	Online
	Please register on C@mpus for examination	C@mpus-System
03/12/2020, 11:30–13:00	How to write a seminar paper	Online
10/12/2020 09:45–13:00	Intermediate oral presentation & discussion: outline, progress, questions	Online

07/01/2021, 11:30–13:00	How to give a seminar presentation	Online
21/01/2021, 11:30–13:00	Organized peer-reviews of papers	Online
04/02/2021, 11:30–13:00	Organized peer-review of presentations	Online
09/02/2021, 12:00	Deadline for submitting papers and presentation material on ILIAS	Ilias
10/02/2021, 09:45–17:15	Presentation of seminar papers	Online

Intermediate supervision

During the period of writing the seminar paper and preparing the presentation, advice can be sought with the research associates of the department, Mr Brauch and Mr Đula in KII, 07.005, Tuesdays 10:00–12:00 or after making an appointment. It is advised that students use this opportunity two or three times but not more than five times.

Examination

Student assessment is based on a written and an oral examination: seminar paper and seminar presentation. Weight: seminar paper 60%, seminar presentation 40%.

The seminar paper should not be longer than 12 pages (or 15 pages including cover sheet, table of contents, and literature list), font size 12 points, font type Times New Roman, line spacing 1.5, margins 2.5 cm (top and bottom) and 2 cm (left and right). Please provide page numbers. The cover page should include the title of the paper, the student's name and matriculation number. Please provide an electronic (on Ilias) as well as a paper version before the presentations (i.e., deadline: 09 February 2021, 09:45). With regard to the criteria for a good paper, please check the learning objectives. A structure with more than five sections or more than two levels of sub-sections is not useful for a seminar paper. More information on formal requirements can be found at <https://www.bwi.uni-stuttgart.de/studium/pdfs/Zitierrichtlinien.pdf>.

The seminar presentation should not be longer than 45 minutes, including time for discussion. Thus, it must focus on the importance and relevance of the topic being discussed, the simulation model employed, the most important findings within the paper, and a criticism and extension of these findings. Powerpoint slides are a possible way to support the talk but other forms (e.g., speech with hand-outs, Prezis, posters, model walk-throughs) are also encouraged but must be organized by the students. Presentation material must be made available to the teachers for assessment. Students must be prepared to answer questions regarding their presentation and paper.