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UNIVERSITY OF MANNHEIM
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Bachelorarbeitsthemen - Wirtschaftspädagogik

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1. **Quality-speed trade-offs in Operations Management**

   The speed or the service rate of many operations can be controlled, for example, by accelerating services, simplifying processes, or by reduced up- and cross-selling activities. On the one hand, a higher service rate decreases congestion, and thus waiting in the system. On the other hand, a higher service rate can lower the quality of the service provided or product manufactured. This so-called quality-speed trade-off is analyzed with different objective functions for different industry applications.

   The goal of this thesis is to provide a detailed overview and classification of optimizations models with decisions on the service rate according to a quality-speed trade-off. The underlying motivation of the objective functions should be explained. Moreover, the optimization problems should be classified with respect to the dimensions of the variability cube (Stolletz and Tan, 2024). Relevant applications and managerial insights should be identified. A critical assessment of the literature concludes this thesis.

   Literature: Anand et al. (2011), Stolletz and Tan (2024)

2. **Virtual waiting in service operations**

   The concept of virtual waiting is used in airports, amusement parks, call centers. After the registration at arrival, the customer can leave the queue and does not have to wait in line. The customer returns to the queue at a specified point in time. The advantage for the customers is that they can use their time more effectively.

   The objective of the thesis is to give an overview over such virtual waiting options in service operations based on literature or business applications. Possible applications of this concept have to be described in detail. The specific assumptions and rules of the virtual waiting system should be described, compared with each other, and critically assessed.

   Literature: De Lange et al. (2013)

3. **Overview of resilience metrics in supply chains and production systems**

   It is estimated that almost three quarters of organizations experience a supply chain disruption each year, i.e. an event that impacts the flow of goods, materials and/ or services, thereby limiting the ability of an organization to serve the end consumer. Possible external disruptions can originate from financial and political turbulences,

others are internal, e.g. production line break downs, IT problems, or demand fluctuations. Meanwhile, the performance impact of such events is also dependent on the severity and duration of the disruption as well as on the organizations' ability to manage disruptions and threats. Resilience is defined as the ability to recover quickly and effectively from a disruption. Resilience level of a system can be quantified with different resilience metrics, such as time to recovery or lost performance during recovery. Resilience can give the organization a competitive advantage, as it is able to continue operating even in the face of disruptions.

The goal of this bachelor thesis is to give an overview on resilience metrics in supply chains and production systems. Quantitative approaches and resilience metrics for analyzing and measuring resilience levels should be explained and compared for different applications. Furthermore, the managerial implications of utilized resilience levels should be presented and discussed.

Literature: Behzadi et al. (2020)

Literatur

Anand, K. S., M. F. Paç, and S. Veeraraghavan (2011). Quality–Speed Conundrum: Trade-offs in Customer-Intensive Services. *Management Science 57*(1), 40–56.

Behzadi, G., M. J. O'Sullivan, and T. L. Olsen (2020). On metrics for supply chain resilience. *European Journal of Operational Research 287*(1), 145–158.

De Lange, R., I. Samoilovich, and B. Van Der Rhee (2013). Virtual queuing at airport security lanes. *European Journal of Operational Research 225*(1), 153–165.

Stolletz, R. and B. Tan (2024). When and how to (mis-)match supply and demand: Managing variable environments. Available at SSRN: `https://ssrn.com/abstract=4735439` or `http://dx.doi.org/10.2139/ssrn.4735439`.