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UNIVERSITY OF MANNHEIM
Business School

Bachelorarbeitsthemen - Wirtschaftspädagogik

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1. **Rethinking global supply chains**

   It is estimated that almost three quarters of globally operating 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. Last year, 75% of companies have had negative or strongly negative impacts on their businesses due to the COVID-19 pandemic. As global supply chains are subject to increasingly frequent and alarming severity of disruptions, there is a need to rethink the attributes that ensure and enhance the performance of global supply chains. In addition to already established attributes such as agility, adaptability and alignment, robustness and resilience are increasingly in the foreground.

   The purpose of this topic is to focus on the attributes *robustness* and *resilience* that enable global supply chains to recover from current shocks, proactively mitigate future shocks and secure profitability. Based on the literature review provided by Cohen and Kouvelis (2021), delineation, comparison and critical appraisal of these two attributes as well as approaches to their quantitative assessment are also part of the thesis.

   Literature: Cohen and Kouvelis (2021)

2. **The newsvendor problem for workforce planning**

   A classical and crucial building block of stochastic inventory theory is the newsvendor problem. In this problem, a newsvendor decides how much to stock of a perishable product, e.g. a newspaper, for a single selling period, facing random demand. If the actual demand exceeds inventory, the vendor suffers lost revenue, while in the contrary case, disposal or holding costs are incurred. Recently, this model has been used for workforce problems, where the vendor must decide on the assignment of personnel, when there is uncertainty about daily workload. Several variants and extensions of the basic newsvendor model exist addressing different aspects of workforce planning, e.g. workload heterogeneity, nurse staffing, absenteeism etc.

   This topic is intended to provide a comprehensive and topical overview of the newsvendor problem for workforce planning based on the review provided by Qin et al. (2011). The different formulations and variants should be compared, analyzed and the respective advantages and disadvantages identified. Elaborating on research gaps is also an important part of the thesis.

   Literature: Qin et al. (2011)

3. **Virtual waiting in service operations**

   The concept of virtual waiting is used in amusement parks, call centers, and airports. 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)

4. **Applications of queueing systems with impatient clients in service operations**

   Queueing systems are used in various service systems, such as call centres, health care, emergency services, and repair facilities. In many of these service systems, customers leave the queue before being served (e.g. abandonment or balking) due to a lack of patience. However, different business applications result in different assumptions on the queueing model, since some applications have specific characteristics that should be modeled (e.g. limited waiting room due to COVID-19 regulations).

   The goal of the thesis is to conduct a literature review based on real world applications for such queueing systems. Existing literature should be critically assessed and compared with respect to characteristics of considered application areas.

   Literature: Koole and Mandelbaum (2002)

Literatur

Cohen, M. A. and P. Kouvelis (2021). Revisit of AAA excellence of global value chains: Robustness, resilience, and realignment. *Production and Operations Management 30*(3), 633–643.

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.

Koole, G. and A. Mandelbaum (2002). Queueing models of call centers: An introduction. *Annals of Operations Research 113*(1), 41–59.

Qin, Y., R. Wang, A. J. Vakharia, Y. Chen, and M. M. Seref (2011). The newsvendor problem: Review and directions for future research. *European Journal of Operational Research 213*(2), 361–374.