How Many Buyers Does it Take to Build a Car?

Support functions such as procurement may be understood as workflow system delivering value to the organization. A simulation optimization is proposed that depending on inputs such as total spend, diversity of requisitions, and company strategy - through the internal delivery organization with the people, culture, and processes - is delivering output in terms of cost savings, processing speed, and decision quality.

Brief summary as it is posted on ILIAS: The objective of this research is to provide theoretical and practical insights into how to solve the organizational sizing problem by maximizing the value function of procurement using the simulation method. Thus, the thesis would like to focus on the question: How to solve the organizational sizing problem by maximizing procurement value creation?

Master Thesis Topic: Workflow simulation optimization at the example of procurement supply management

Building on an early prototypical implementation, the thesis focuses on building a refined process model exploring the theoretical and practical implications of core aspects of the emerging digital supply chain twin concept through simulation. Simulation expertise is an important and rare skill today and likely in the future - combined with gaining further domain knowledge, adequate data handling techniques, visualization and discussion of the results considering the theoretical foundations of supply management, simulation, and data science provides an interesting opportunity for a master student supervised in collaboration with Prof. Christoph Bode at the Chair of Procurement and the external Ph.D. student Jan Martin Spreitzenbarth.

Requirements

- Hands-on mentality and data creativity
- Interest in business-related problem solving and optimization methods
- Some experience in process analytics and simulation, ideally with AnyLogic
- Basic knowledge of supply chain processes and structures
- Willingness to collaborate with process experts to reconcile findings and results

References

Avatar Engines. (2021). Product. Retrieved from: https://www.avatar-engines.com/#FRAMEWORK.

Barykin, S., Bochkarev, A., Kalinina, O., Yadykin, V. (2020). Concept for a Supply Chain Digital Twin. International Journal of Mathematical, Engineering and Management Sciences. 5 (6), 1498-1515. 10.33889/IJMEMS.2020.5.6.111.

Borshchev, A. (2013). The big book of simulation modeling: multimethod modeling with AnyLogic 6. AnyLogic North America.

Cavalcante, I., Frazzon, E., Forcellini, F., Ivanov, D. (2019). A supervised machine learning approach to data-driven simulation of resilient supplier selection in digital manufacturing. International Journal of Information Management. 49, 86-97. 10.1016/j.ijinfomgt.2019.03.004.

Rahmandad, H. and Sterman, J. (2012). Reporting Guidelines for Simulation-Based Research in Social Sciences. System Dynamics Review. 28 (4), 396-411. 10.1002/sdr.1481.

Spreitzenbarth, J.M. (2021). Simulation Prototype. figshare. Dataset. Retrieved from: https://figshare.com/articles/dataset/Simulation_Prototype/13546805. 10.6084/m9.figshare.13546805.v1.

van der Aa, H., Leopold, H., Batoulis, K., Weske, M., Reijers, H. (2015). Integrated Process and Decision Modeling for Data-Driven Processes. Lecture Notes in Business Information Processing. 256, 405-417. ISSN 1865-1348, 10.1007/978-3-319-42887-1_33.

Veit, F., Geyer-Klingeberg, J., Madrzak, J., Haug, M., Thomson, J. (2017). The Proactive Insights Engine: Process Mining meets Machine Learning and Artificial Intelligence. International Conference on Business Process Management. 15.