A SYSTEMATIC REVIEW OF BUSINESS OPTIMIZATION TECHNIQUES IN SUPPLY CHAINS

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BACKGROUND

Business process optimization is crucial in enhancing efficiency, quality, productivity and overall performance within the supply chain [1]. Optimization technique frameworks are indispensable tools that serve as guiding structures that help select appropriate strategies tailored to specific needs and assist in identifying trends and gaps in the literature for further investigation [2]. However, there is a lack of a comprehensive framework focusing on the complete supply chain. Therefore, there is a pressing need for a comprehensive optimization framework.

RESEARCH OBJECTIVE

- To provide a classification framework
- To classify the existing literature using this framework to give an overview of the state of the art

RESEARCH QUESTIONS

RQ 1: What optimization techniques have been devised in the context of supply chain optimization, and what are their characteristics:

- What are the categorizations of these techniques?
- What are the strengths of each technique?
- What are the weaknesses of each technique?
- What levels does the technique target?

RQ 2: What objectives do business process optimization techniques in the supply chain aim to achieve?

METHODOLOGY

Selection of articles relevant to the topic (n= 22,166)
Scopus (n= 11,264)
Web of Science (n= 10,902)
→ Duplicates removal (n=5.780)

Articles after title screening (n= 2.766)
→ Articles excluded (n=13,620)

Articles after abstract screening (n= 405)
→ Articles excluded (n=2,361)

Articles after removing non-English papers, reviews and books (n= 297)
→ Articles excluded (n=108)

Articles after check of availability of full-text (n= 164)
→ Articles excluded (n=133)

Articles after full-text review (n= 55)
→ Articles excluded (n=109)

RESULTS

OPTIMIZATION TECHNIQUES

- Mathematical models
- Simulation models
- Hybrid models
- Heuristic & metaheuristic models

OPTIMIZATION GOALS

- Financial optimization
- Efficiency
- Sustainability
- Resilience
- Performance
- Decision enhancement
- Customer satisfaction
- Time optimization

SUPPLY CHAIN LEVEL

- Strategic level
- Tactical level
- Operational level

STRENGTHS

- Efficiency
- Multi-objectie optimization
- Resilience
- Parameter insensititvity
- Flexibility
- Scalability

WEAKNESSES

- Uncertainty
- Multiple objective complexity
- Scalability issues
- Time-consuming
- Complexity
- Sensitivity

CONCLUSION

- The study explored the supply chain optimization techniques and developed a comprehensive framework identifying models, objectives, strengths, and weaknesses at supply chain levels.
- Developing a comprehensive framework for supply chain optimization revealed its potential to advance future research by systematically comparing techniques and identifying gaps in the literature while also improving decision-making by aligning strategies with specific supply chain goals and organizational objectives.
- The results highlighted that there should be future research conducted towards hybrid models to reveal their specific strengths, weaknesses and goals of different combinations.

UHASSELT

RELATED LITERATURE

[1] Peng, D., Cheng, L., Zhou, H., & Zhang, X. (2012). Study and application of business process optimization and evaluation. 2012 IEEE Asia-Pacific Services Computing Conference, (pp.380-383). IEEE.
[2] Tsakalidis, G., & Vergidis, K. (2017). Towards a comprehensive business process optimization framework. 2017 IEEE 19th Conference on Business Informatics (CBI), (pp.129-134). IEEE.