Journal of Industrial Engineering and Management • *Open Access* • Volume 15, Issue 3, Pages 385 - 415 • 2022

Document type
Article • *Gold Open Access* • *Green Open Access*

Source type
Journal

ISSN
20138423

DOI
10.3926/jiem.3539

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Barriers for Implementing Reverse Logistics in the Construction Sectors

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Abstract

Author keywords

Sustainable Development Goals 2023

SciVal Topics

Metrics

Funding details

Abstract

Purpose: This paper aims to identify the barriers to implementing Reverse Logistics in the construction sector and rank the barriers between the stakeholder, the phase in the project life cycle, and the strategic factors on the emergence of obstacles in implementing reverse logistics.
Design/methodology/approach: This research began by identifying barriers re-verse logistics through a systematic literature review. The method used in the systematic literature review was the PRISMA method. Next, the identification of barriers was assessed for their influence on successful reverse logistics implementation by the expert using a questionnaire instrument. The rating scale used was a Likert scale of 1 (greatly hinder the implementation of reverse logistics) to 5 (not significantly hinder the implementation of reverse logistics). Finally, the results of the expert assessment were used to rank barriers using TOPSIS. Findings: There are 38 barriers in this study, classified as market and competitor factors, policy factors, supply chain factors, economic factors, knowledge-related factors, government

Source details

Journal of Industrial Engineering and Management

Open Access

Scopus coverage years: from 2008 to 2022

Publisher: OmniaScience

ISSN: 2013-8423 E-ISSN: 2013-0953

Subject area: Engineering: Industrial and Manufacturing Engineering

Business, Management and Accounting: Strategy and Management

Source type: Journal

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OmniaScience

Printed edition: Journal of Industrial Engineering and Management

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Language: English
Binding: Perfect-bound Paperback
Interior Ink: Black & white
Dimensions (cm): 21.0 wide × 29.7 tall

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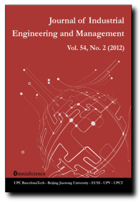

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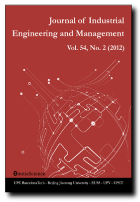
Journal of Industrial Engineering and Management, 2008-2023
Online ISSN: 2013-0953; Print ISSN: 2013-8423; Online DL: B-28744-2008
Publisher: OmniaScience



OmniaScience

Journal of Industrial Engineering and Management
JIEM, 2022 – 15(3): 385-415 – Online ISSN: 2013-0953 – Print ISSN: 2013-8423
https://doi.org/10.3926/jiem.3539

Barriers for Implementing Reverse Logistics in the Construction Sectors

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Received: March 2021
Accepted: October 2021

Abstract:

Purpose: This paper aims to identify the barriers to implementing Reverse Logistics in the construction sector and rank the barriers between the stakeholder, the phase in the project life cycle, and the strategic factors on the emergence of obstacles in implementing reverse logistics.

Design/methodology/approach: This research began by identifying barriers re- verse logistics through a systematic literature review. The method used in the systematic literature review was the PRISMA method. Next, the identification of barriers was assessed for their influence on successful reverse logistics implementation by the expert using a questionnaire instrument. The rating scale used was a Likert scale of 1 (greatly hinder the implementation of reverse logistics) to 5 (not significantly hinder the implementation of reverse logistics). Finally, the results of the expert assessment were used to rank barriers using TOPSIS.

Findings: There are 38 barriers in this study, classified as market and competitor factors, policy factors, supply chain factors, economic factors, knowledge-related factors, government support factors, and operational factors. The classification of barriers based on the project life cycle aims to increase stakeholder collaboration on reverse logistics performance issues. The results of this study indicate that the lack of government support for the implementation of RL (GS1) is the obstacle with the highest rank. These barriers are related to government support factors and arise in the green initiation phase of the project life cycle approach. The government's role as regulator and project owner will overcome GS1 barriers.

Research limitations/implications: The limitation in the scope of this research is specific to the construction sector in developing countries, particularly Indonesia. The object of construction in this study is the case of the Penjagaan-Losari highway project. Further research that examines barriers based on the project life cycle by entering the company scale or studying the relationship between barriers can also be done.

Practical implications: This study provides an analysis to stakeholders about the barriers in implementing reverse logistics. The ranking results become a reference for relevant stakeholders in developing a successful strategy for implementing reverse logistics and the PLC approach phases as a guideline for implementing the established strategy.

Social implications: The stakeholder of the construction project has to learn with reverse logistics barriers to improve reverse logistics performance.

Originality/value: This study analyzed reverse logistics implementation barriers in the construction sector in developing countries. The majority of research on reverse logistics implementation barriers examined the manufacturing sector in developed countries. This study also identifies barriers that show the relationship between barrier emergence in the project life cycle approach and stakeholders responsible for addressing barriers and associated problems. Previous research only identified obstacles based on

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Journal of Industrial Engineering and Management
JIEM, 2022 – 15(3): 416-432 – Online ISSN: 2013-0953 – Print ISSN: 2013-8423
https://doi.org/10.3926/jiem.3715

Production Sequence Determination to Minimize the Required Storage Space for the Multiple Items Production System

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Received: September 2021
Accepted: March 2022

Abstract:

Purpose: The research studies the production system having multiple items being processed on the same production line. The objectives are to (1) investigate the influence of production sequence on the optimal value of production run size, (2) explore the effect of production sequence on the maximum inventory level, which can affect the storage space required, and (3) propose a method to determine the proper production sequence in order to minimize the required storage space.

Design/methodology/approach: Finding that the optimal production sequence, which yields the lowest storage space required, is independent of the production run size, the research problem is divided into two independent subproblems. The first subproblem is to determine the optimal production run size to minimize the total variable cost. Here, the solution obtained from the classical multiple items EPQ model still holds. The second subproblem is to explore the proper production sequence in order to minimize the storage space required. The relationship between the production sequence and the value of maximum inventory level is determined and formulated. To explore the proper production sequence, a genetic algorithm is developed. For the performance evaluation, two experimental studies are conducted. The first experiment is to compare the solution obtained from the proposed method with the optimal solution yielded from the enumeration method on 360 small size problems. The second experiment is conducted on 180 large size problems. The result obtained from the proposed method is compared with the result yielded from the Largest Pi First (LPF) heuristic constructed by arranging the production of each item according to its production rate in non-increasing order.

Findings: It has been found that the optimal production sequence is independent of the production run size. Nonetheless, different production sequences yield different required storage spaces. With the proper production sequence, the manufacturer can reduce the total space required to keep its inventory. The proposed genetic algorithm can be applied to determine the proper production sequence in a reasonable amount of time. For the small size problem of 8 and 10 production items, the 95% confidence interval on mean of the percentage deviation between the solution yielded from the proposed genetic algorithm and the optimal solution is (0.0015, 0.0123). For the large size problem of 15 production items, the proposed genetic algorithm provides the better solution than the LPF heuristic for 158 out of 180 problems with the 95% confidence interval on mean of the percentage deviation of (5.5629, 7.0435). For those remaining 22 problems, the two methods yield the same results. In comparison to the LPF heuristic, the benefit of genetic algorithm is more pronounced when the slack proportion is getting smaller.

Research limitations/implications: According to the research model, no shortages are allowed. Therefore, the model is applicable for the production system having the summation value of the ratio between demand rate and production rate for all items not greater than one.

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Journal of Industrial Engineering and Management
JIEM, 2022 – 15(3): 433-454 – Online ISSN: 2013-0953 – Print ISSN: 2013-8423
https://doi.org/10.3926/jiem.3673

Proposal and Validation of an Industry 4.0 Maturity Model for SMEs

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Received: July 2021
Accepted: February 2022

Abstract:

Purpose: This paper seeks to establish an Industry 4.0 maturity model for manufacturing SMEs. This research presents the characteristics of the proposed model, which takes the elements and the scope of the fourth industrial revolution, as well as the dimensions and assessment scales of some maturity models already applied. Likewise, this document shows the modelling process and the model's validation in SMEs in the city of Bogotá-Colombia.

Design/methodology/approach: To determine the criteria of the maturity model, 6 major stages have been established: Literature Review, Development of the model; Validation of the model; Application of the model; Data analysis; and Conclusion and Recommendations.

Findings: Considering the validation of some maturity models shown in the literature review, and aligned with the purpose of this article, 8 dimensions have been established to measure the maturity level of SMEs: Service; Operations; Quality; Products; Documented information- Big Data; Leadership and strategy; Communication; and Culture and people. A model has been generated that allows evaluating the degree of compliance in each dimension for manufacturing SMEs. The model can be applicable to companies in any industry. Also, it can determine the degree of implementation compliance of companies in the same sector.

Research limitations/implications: According to the literature reviewed, SMEs, especially those in Latin America, still do not have a culture of applying the elements of Industry 4.0. Therefore, in the research, it was not easy to understand the intrinsic variables of Industry 4.0 that SMEs have applied in different areas, which does not allow us to have the current context of SMEs and from that perspective to have a better simulation of the business model maturity.

Practical implications: The model presented in this document serves as a basis for SMEs in Latin America to establish a baseline measurement in relation to the application of Industry 4.0 elements in companies.

Social implications: What is intended with this work is to frame a baseline so that companies can understand their current maturity level in the terms that industry 4.0 could cover. Likewise, they can generate actions for the appropriation of new technologies that allow them to be more competitive. This document can be taken and applied by those entrepreneurs companies who wish to measure their operations.

Originality/value: The essential point for the generation of the maturity level measurement model is focused on determining the necessary dimensions on which the evaluation is based. In the literature found, most models focus their dimensions on measuring the digital in their processes and tangentially evaluate

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Journal of Industrial Engineering and Management
JIEM, 2022 – 15(3): 455-469 – Online ISSN: 2013-0953 – Print ISSN: 2013-8423
https://doi.org/10.3926/jiem.3925

Improving Patient Access in Oncology Clinics Using Simulation

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Received: February 2022
Accepted: April 2022

Abstract:

Purpose: Providing timely access is an important measure of patient satisfaction in specialty care clinics such as cancer centers. Excessive patient wait time to see an oncologist is very critical for cancer patients as they often benefit from starting the treatment process as soon as possible. This paper addresses capacity planning for both new and returning patients in cancer clinics. This research is motivated by a cancer center in Texas that seeks to improve its clinical performance to decrease new patient wait time to see an oncologist.

Design/methodology/approach: A simulation model is proposed to assess new patient access to oncologists when employing several tactical and operational policies such as resource flexibility, specialization flexibility, and reserving slots for new patients. The model utilizes two years of data collected from a cancer center in Texas.

Findings: The results suggest the best combination of operating policies in order to allocate patient demand to providers. This study also determines the required capacity level to provide timely access for new patients.

Originality/value: Although the literature in outpatient scheduling and capacity planning is rich, new patient access in oncology clinics has received limited attention. The few existing studies do not consider patient no-shows and cancellations, and to the best of our knowledge, no study addresses individual oncologist clinic flexibility and the idea of reserving slots for new patients.

Keywords: patient access, capacity planning, simulation, resource flexibility, oncology clinics

To cite this article:

Keshtzari, M., & Norman, B.A. (2022). Improving patient access in oncology clinics using simulation. *Journal of Industrial Engineering and Management*, 15(3), 455-469. https://doi.org/10.3926/jiem.3925

1. Introduction

Cancer is recognized as one of the leading causes of death worldwide. According to estimates from the International Agency for Research on Cancer (IARC), the global number of new cancer cases is expected to increase annually (Bray, Ferlay, Soerjomataram, Siegel, Torre & Jemal, 2018). Therefore, if oncologists are not well utilized, or clinic capacity does not match with increasing demand, patients will have to wait an excessive amount of