

Chapter 20

Using Ordinal Priority Approach With Confidence–Level Measurement for Third–Party Logistics Provider Selection in the Tunisian Healthcare Sector


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ABSTRACT

This study aims to present a comprehensive decision methodology for selecting a 3PL provider in the healthcare sector that assists the decision-makers in taking the most appropriate decision for selecting and evaluating the 3PL provider. The ordinal priority approach (OPA) method is used to solve this problem and estimate the weights of the experts, criteria, and 3PL providers. The authors apply the OPA method with Kendall's coefficient of concordance (W) and confidence level measurement to estimate the agreement degree or concordant degree among experts, criteria, and alternatives. The authors developed a probabilistic method of 3PL provider selection under imperfect information by employing a novel confidence level measure, guided by the philosophy of statistics and the ordinal priority approach (OPA). The authors evaluated and selected the suitable 3PL provider problem in a Tunisian hospital by using the OPA method. They considered the case of pharmaceutical products.

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1. INTRODUCTION

Health care is an important, community-wide approach to health and well-being that is built around the needs and priorities of individuals, families, and communities. A well-equipped health system is needed for a country to provide necessary medical and healthcare services (Fan et al., 2020; Javed et al., 2019). A health management system covers the operational activities, plans, and capabilities of a health facility. The introduced inventory systems, demand forecasting, resource allocation, waste treatment and disposal systems, and capacity planning roughly correspond to the measures of the introduced logistics concepts. (Diana Božić et al. 2022)

Since the emergence of the Corona pandemic, healthcare sector has witnessed a major development and transformation in all countries in the world, and the need for a healthcare logistic system has become that guarantees the flow of medicines and goods, improves the quality of services, and reduces costs and risks of the different operations. In recent years, logistics functions have occupied an important position in hospital management (Volland et al., 2017). The concept of healthcare logistics has gained an important place in the world and in several research, as it is one of the important modern concepts for organizing multiple and complex operations in healthcare systems.

Logistics is a component of supply chain management that includes planning, execution, delivery, and control of information, goods, and services, which is primarily concerned with the delivery of commodities and services to satisfy various client needs (Council of Supply Chain Management Professionals, 2018). Just like the definition and concepts of logistics, the purpose of healthcare logistics is also to deliver the right amount of healthcare products to customers at the right time. In addition, in healthcare logistics, the sharing of healthcare products or medicines must be of acceptable quality and meet specific standards of the healthcare sector and, moreover, be mutually beneficial (Caveman, et al., 2005). While there are some differences between the term healthcare logistics and traditional logistics due to the characteristics and requirements of logistics operations in healthcare ((El-NEMR et al., 2020; Gao et al., 2018; Husna et al., 2021).

Healthcare organizations are currently facing many strategic decisions related to logistics, including outsourcing of certain activities in the hospital supply chain such as purchasing and supply chain management, sterilization and inventory management, internal transportation (Ageron et al 2018; Taghipour et al., 2023a; Taghipour et al., 2022a ; Taghipour, 2020 ; Taghipour et al., 2020).

Third Party Logistics (3PL) is also known as logistics outsourcing. This means that companies outsource some or all their logistics-related activities to third-party companies or organizations and make those companies or organizations responsible for the same (Etokudoh and Boolaky, 2017). As market competition intensifies, companies are becoming more aware of the importance of their core competencies, which is why outsourcing of logistics functions is gradually increasing (Sahay and Ramneesh, 2006).

As a result of the changes, the world has witnessed after the COVID-19 pandemic, outsourcing of logistics activities, known as 3PLs, has become an important strategy for companies, including hospitals and healthcare organizations that want to gain a competitive advantage and improve their quality service and product.

Third-Party Logistics (3PLs) are a concept that first arose in the 1980s in both the United States and Europe. They are a one-to-one service provided by an intermediary between the consignee and the consignee at a specified price within a specified period. Based on modern information technology, such as just-in-time delivery and order aggregation, to achieve a faster reaction to the

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