

A Hybrid Decision-Making Model for Selecting Container Seaport in the Persian Gulf



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Abstract

Ports have always played a vital role in international transportation. Port selection decision is a process that requires consideration of many important and relevant criteria. The selection of the influential decision-making criteria is also a significant and vital issue which demands cautious thoughts. The main objective of this paper is to weigh the most dominant decision-making criteria by Technique for Order Preference to Similarity by Ideal Solution (TOPSIS) and select an optimised container seaport in the Persian Gulf by Analytical Hierarchy Process (AHP) according to decisive port selection factors. This paper presents an extensive review of port selection decision-making attributes in different past studies. Finally, by using TOPSIS and AHP, the findings of this research suggest that the working time, stevedoring rate, safety, port entrance, sufficient draft, capacity of port facilities, operating cost, number of berths, ship chandelling, and international policies are critical factors for selecting container seaport in the Persian Gulf.

Key Words : Port Selection Factors, Containerisation, Container Seaport Competition, AHP, TOPSIS, Carrier

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I. Introduction

Today is the era of container seaports, the middle-east and the Persian Gulf coastal countries are no exception. More than 60 per cent of the world general cargo trade moved by sea is carried in containers. On trades between highly industrialised countries the percentage exceeds 80 percent.¹⁾

Container seaports are considered as gateways to international trade by all maritime nations. The modern and equipped ports in this era are craving to attract more container vessels and benefit from greater throughput. Even in developing maritime countries, to maximise the seaport's revenue and at the same time making the port more appealing to both ship owners and shippers, these countries are obliged to develop their seaports and improve the quality of their services. The creation of competitive environment among seaports (particularly, among homogenous port providing similar services) has made the phenomenon of port selection a complicated decision-making task.

This paper presents a hybrid decision-making model for port managers, agents, and shipping lines to select the most appropriate container port in the Persian Gulf region for the first time. In achieving this purpose, TOPSIS is used to rank the most influential criteria affecting shipping companies in choosing a container seaport. Then, by utilizing AHP method, the ranked attributes will be employed to select the most appropriate container seaport among Jebel Ali (UAE), Shahid Rajaei, BIK, and Bushehr (Iran), and Dammam and King Fahd Port in Jubal (KSA).

The section is followed by a discussion on seaport competition and related topics. Section 3 explains the research methodology, including AHP and TOPSIS techniques. The survey results are presented in section 4. Finally, section 5 addresses the conclusion.

II. Seaport Selection Factors

Nowadays, the container port industry is very competitive and users such as shipping lines and agents select a port based on the criteria offered such as low tariffs, safety, ease of access, minimum turn around, waiting,

1) World Bank(2001)

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