



Supply chain risk management in the construction sector in the Kingdom of Saudi Arabia

Supervision

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1. Introduction

Due to the great competition between companies, it has become difficult for companies to achieve the integration of all procedures required to produce a specific product at the specified speed and with the required quality in order to achieve customers satisfaction (Ermoshin,2018)

It has become the interest of companies in the first degree to increase competitiveness (Francis & Tharakan,2023); (Bhatti & Bauirzhanovna, 2023) and therefore there has been a need for outsourcing working on the performance and integration of all activities to obtain the final product (Inbound logistics,2023). These external sources are the creation of a supply chain consisting of other companies and suppliers that customize activities according to the company's requirements.

Supply chain can be defined as an integration of product life-cycle operation which includes several flows like physical, information, funds. The objective of supply chain is to achieve final -utilizer demands with a product or a service (Dammert, 2021). Supply chain includes a variety of procedures and activities that transmute the material via the SC from the initial suppliers to the end-user. consequently, supply chain comprise the internal tasks of the corporate addition to external outsourcing such as companies and suppliers. Supply chain is a grid that connect all these suppliers until the end user (Albertin,2017). SCM can be identified as the combination of several

enterprises units of the entire supply chain and the organization of substances , information and financial flows to offer a product to an end user.the basic goal is to link business tasks and operations within and across firms in high performace manner(Pujawan & Bah,2022).

Risks can negatively affect the performance of the supply chain, which threatens the company's performance and affects the company's profitability. Risks also make the supply chain more complex (Mai et al,2022). It is possible through risk management, which is represented by identifying risks, assessing and prioritizing them, and then taking effective solutions to mitigate them. The goal of risk management is to ensure the flow of the planned processes and to preserve the firm versus supply chain issues (Albertin , 2017) and the Figure 1 shows risk management process



Figure 1. Risk Management (Albertin , 2017)

Due to inability of supply chain management to address the problems resulting from risks, the need arose for the term supply chain risk management, which expresses the integration between risk management and supply chain management as illustrated in Figure2 (Albertin , 2017)

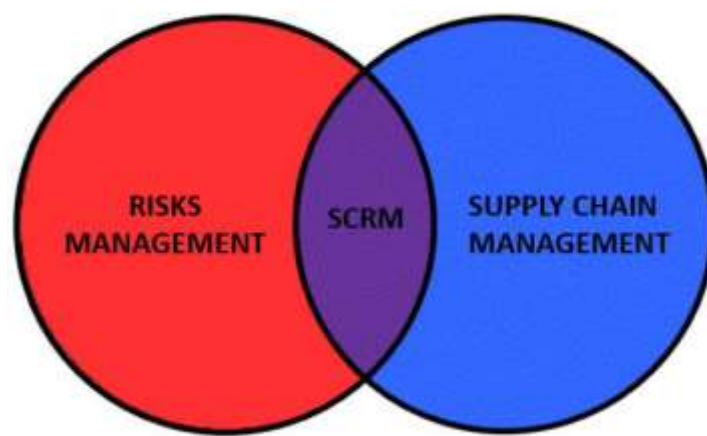


Figure 2. The combination between SCM and risk management issues (Albertin , 2017)

2. Problem Statement

Lack of planning and coordination of events and processes in the supply chain leads to disruptions and disruption of the supply chain that negatively affects the company's performance, as production costs increase, profitability decreases, losses increase, and the product is not delivered on time (Abdel-Basset et al, 2019)

Nowadays, the construction sector is facing numerous issues all over the world

One of the areas that is most affected by the disruptions resulting from the supply chain is the field of construction, where the construction sector faces many difficulties resulting from the risks of the supply chain (Qureshi et al,2020).In view of the great complexities occurring in construction projects and the risks facing the life of the project and the complex relationships between the various parties to the project, it is necessary to have an effective management of the risks facing the supply chain in the construction sector, which cause cost overruns and cause delays in projects (Shojaei & Haeri,2019).

Saudi Arabia is facing delays and cost overruns in construction projects due to supply chain disruptions(Alshihri et al,2022). It has been noted that the construction industry in Saudi Arabia ended only 30% of projects within the planned period and the average period consumed was between (10% -30)% (Shahbaz et al,2019). In view of the problems and complications resulting from the disturbances in the supply chain in the Saudi construction sector, this study is concerned with risk management in the supply chains related to the construction sector in Saudi Arabia.

3. The importance and Objective of the Research

The importance of this study comes from the fact that it tries to enhance the supply chain risk management strategies in the Saudi construction sector and

enhance the performance of the construction supply chain. It also provides project managers with a reference for potential supply chain risk management. The major goal is to identify, evaluating and analyzing, developing methods of reducing and managing supply chain hazards in the Saudi construction sector. Some of minor objectives can be achieved :

1- To identify all risk factors affects negatively on Supply Chain in construction sector.

2-To prioritize the most risk factors affects on construction supply chain in Saudi Arabia

3- To investigate the most effective strategies that mitigate risks in construction supply chain

4- To provide guideline and principle that can be benefit to raise awareness of managers construction companies about the potential risk supply chain and the effective and suitable strategies to treat these risks and mitigate them.

4. Research hypotheses

- a. providing all the demanded mankind , material, technological sources can achieve the efficient supply chain hazard management
- b. Creating a guidelines and manual to supply chain hazards management and train personnel helps to raise the knowledge and culture of hazard management activities.
- c. Raising awareness about construction supply chain hazards has a significant impact on avoiding time and cost overrun in construction projects.

- d. The correct exchange of information, effective control of supply chains, and communication channels contribute to reducing the risks of construction supply chains

5. Literature Review

With regard to the construction industry, a very limited number of studies addressed supply chain risk management:

(Marandi et al,2023) Conducted a supply chain risk assessment for green building projects. and found that evaluating supply chain hazards' in green residential mega projects is a novel contribution to mega construction-project management's body of knowledge. in addition , the major hazard factors were classified depend on the properties called driving power and dependence.

(Shojaei & Haeri,2019) suggested a comprehensive SCRM method for construction industry that utilizes grounded theory, fuzzy cognitive mapping, and grey relational analysis. A real world was utilized as case study to illustrate the degree of applicability and efficient of the suggested method. The proposed approach has demonstrated its ability to visualize risks in an efficient and accurate manner.

(Darko et al ,2016) identified the most risk factors affect on supply chains in construction industry in Ghana . the risk factors have been collected using comprehensive literature review then the most risk factors evaluated using questionnaire by asking construction companies then the data were analyzed using statistical analysis . The results found that prices fluctuations , interest

rates variations, lack of materials, repeated variations in SC inputs and unforeseen variations in demand are the most risks affects on construction supply chains.

(Nurdiana et al,2019) guided a research to identify the hazards of SC in construction industry, analyze the hazards, and investigated strategies to mitigate hazards. study method based on conducting questionnaire ad and descriptive statistical analysis . risk analysis adopted Promethee method, the results found that the most hazard in SCM is the price from sub-contractors.

(Liao et al,2019) published a research paper in which he emphasized that the effective management of the supply chain in construction sector has an important impact on improving the competitiveness of enterprises. He also stressed the need to manage supply chain risks in general to avoid cost overruns and delays in projects.

(Tang & Xu, 2023) Identified the risks facing the construction supply chain by reviewing the literature and conducting a statistical analysis, as it clarified the internal and external risks of the supply chain. It also concluded that right information exchange , efficient control of supply chains, smooth communication channels, proper insurance, new utilization of novel technology are basic to address several construction supply chain hazards

(Ting et al ,2020) Conducted a literature review including all studies conducted between 2000 and 2018 on supply chain risk management practices in the construction sector. It was found that there is a lack of awareness and

knowledge about the risks of construction supply chains, in addition to the lack of sufficient knowledge of effective supply management strategies in the construction sector.

(Sugathadasa ,2018) He identified the supply chain risks in the construction industry in Sri Lanka, and he classified the risks into three categories: risks arising from the client, risks arising from the consultant, and the third resulting from the contractor, represented by planning risks, decision-making risks, financial risks, communication risks and subcontractor risks.

6. Research Methodology

The methodology of this research is based on the following points:

- 1- Identification of potential risks in the supply chain of the construction sector through a complete review of the literature
- 2- Classifying risks into categories commensurate with the construction sector
- 3- Reviewing all the literature that includes supply chain risk management strategies in the construction sector.
- 4- Organizing a questionnaire targeting a number of Saudi contracting companies and the construction sector, including project managers, engineers, supervisors and workers, to assess risks in terms of the degree of impact and probability of occurrence, in addition to identifying the most effective strategies. Effectiveness to mitigate and control supply chain risks in the construction sector
- 5- Perform a statistical analysis of the data using the Spss software

6- Discuss the results and come up with a guide that benefits Saudi construction companies to identify potential risks before starting the project and effective supply chain risk management strategies for each potential risk

7. Research limits

This study requires conducting a survey on a large number of construction companies, which represents a great difficulty in conducting a visit to a large number of construction companies. This problem will be overcome by sending a questionnaire to the email.

8. The general perception of the research structure

The structure of the study will be based on the adoption of five chapters in the thesis:

Chapter One: The first chapter includes a general introduction to the thesis represented by providing a background on supply chain risks, presenting the research problem, the importance of research, research objectives, research hypotheses and research limitations.

The second chapter: It includes a literary review that includes the definition and types of risks, their evaluation, and ways to mitigate and control them, in addition to a review of all potential risks in supply chains in the construction sector. A complete review of supply chain risk management strategies in the construction industry will also be conducted.

Chapter Three: This chapter includes a presentation of the study methodology, the selection of the study sample and the questionnaire, and an explanation of data analysis methods using the SPSS program

Chapter Four: This chapter discusses the findings to identify the most potential risks in the supply chain and effective ways to manage these risks in the construction sector

Chapter Five: This chapter presents a summary and recommendations to increase construction companies' awareness of supply chain risks and provide them with effective risk management strategies

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