

# Managing and Controlling Airport Construction Projects: A Strategic Management Framework for Operators

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**Abstract**—Challenges and difficulties of managing construction project increases when the context is related to an airport environment. Consequently, there is a need for holding bodies of airports to change their procedures and practices in order to accommodate the unique and complex construction environment. Within an airport environment, different strategies play a significant role in achieving organizational success through an effective and efficient delivery of various construction projects. Those strategies are influenced by project management strategies and human-related competencies. This is, in turn, requires strategic competence and ability at both functional and operational levels. Several researchers have shown a growing interest in operating strategies and human-related studies within the construction industry; however, an integrated study of these two factors has been lacking, particularly in an airport context. This paper reports the initial work of a research project which seeks to integrate the theories associated with project and human resource strategies within the construction industry. Its aim is to develop a theoretical framework for airport operators to implement in order to cope with an airport environment and enhance business operations when managing and controlling construction projects.

**Index Terms**—construction industry, airport construction, project management strategy, human resource strategic management.

## I. INTRODUCTION

The construction industry is one of the major industries in terms of both size and impact [1]. It is considered not as a single industry but one where several market sectors integrate to form the industry. Indeed, there is no obvious agreement on the classification of construction sectors or on how the industry can be broken down into different categories [1], [2]. Construction plays a significant role in the overall economy of both developed and developing countries in terms of economic growth. Its various activities and related projects also have a great impact on different key factors of a country's overall development aspects [3]. Therefore, it is essential for construction activities to be accomplished successfully in an effective and efficient way. This requires various strategic and management capabilities.

Among the different types of construction sectors and their numerous types of construction works, airport projects, in particular, are very complex and have unique characteristics. In an airport, a number of significant and diverse activities are performed, whether within the airside, terminal or landside zones. Airport owners or statutory bodies/operators need to manage both air transport operations and also real estate investments and various construction projects [4].

A variety of people, project stakeholders, management processes, tools and techniques are involved with airport activities and contribute to accomplishing construction works. Their management, interaction, communication and development require the application of efficient and effective strategic management tools and techniques in order to achieve project success. Internal project activities, external environment and human-related factors are considered to be major elements that contribute to a construction organization's ability to attain high levels of organizational performance and secure project success [5].

## II. CHARACTERISTICS OF AIRPORT CONSTRUCTION

An airport industry is a very large investment with a high level of impact on a region's economic values and development. This is associated with extreme complexities and difficulties that face an airport operator, which is responsible for operation, management and infrastructure development. Ref. [6] cited that airports are becoming a multimodal transportation hub link with large numbers of buildings within substantial areas that constantly require refurbishment and/or expansion in order to meet the community needs, growth and changing needs of the industry. Construction projects within an airport environment therefore represent a fundamental part of its operations. Numerous recent journal articles and publications have dealt with various aspects of managing airport operation. However, despite this theoretical base, there is a lack of rigorous literature that examines the management of airport construction projects and their related issues. Researchers and practitioners through case studies, journal articles and annual reports have illustrated the reasoning behind the challenges that face operators in managing and controlling construction projects [4], [6]-[10].

A comprehensive review of related literature has revealed the unique characteristics of an airport construction environment; this has led to an underlining of its various challenging and complex factors. According to Ref. [11] infrastructure and transport services are basic ingredients of a country's economic growth, development and production. Adequacy, quality, reliability and quantity of infrastructure and transportation within a country are key factors of its ability to survive and compete globally. The air transportation sector, in particular, has been promoting various industries to expand their business and markets which eventually benefit the region. Other factors, such as cross border investment, increased communications, international market operations and growth in population, travel and tourism, have brought more emphasis on the vital role that airports play.

Security levels in airports are always high, whether in landside, terminal or airside areas. The majority of airport staff face a number of obstacles when, for instance, entering terminal or airside. Supplementary security procedures must be applied to personnel involved in construction projects that would not be the case if working elsewhere. These might include security checks by a specific security agency in the country along with badges and licences for all workers, drivers and vehicles [4]. Insurance policies also differ markedly from ordinary construction sites. Contractors must be fully aware of safety rules and regulations that are not applicable on landside [10]. More challenges and difficulties are associated with expansion and refurbishment projects, which are the most common type of airport construction activity, in terms of the selection of materials, operating and facility systems that must be coherent with the existing area. As an airport is typically open 24/7, construction works can often only be carried out when traffic and passenger capacity is low; normally during inconvenient night working hours.

Airport construction projects have many different stakeholders, all of whom have a significant input during the project life cycle. This is due to large number of activities associated with aircraft and passenger flows [12]. Consequently, reaching an agreement among various demands and requirements is not a straightforward process. Ref. [4] illustrates how several key stakeholders within an airport construction project can drive various construction requirements based on their functions; for instance, terminal coordination, commercial, traffic coordination, customs/security and design.

Various activities and functions within airports impose the design outline and specification to be established and prepared by an airport operator/administrator prior to involvement of construction practitioners [4]. Consequently, designers' and contractors' responsibility levels for design and/or functional quality can be reduced. It may also limit the advantages of their knowledge and technical experiences.

Besides a country's growth and development demands, the reasoning behind many expansion, refurbishment and

new airport projects are plans and preparations to host big sporting events, such as the World, Olympic and Paralympic Games [8]. The scheduled time frame is extremely crucial in such projects; for example, Brazil's airports preparations for the 2014 World Cup and the 2016 Olympic games.

Fig. 1, illustrates the features of an airport construction environment, which distinguish it from any other construction sector and contribute to increase the various challenging and complex factors facing airport operators. Strategic project management seems to play a crucial role in alleviating this tendency and enhancing organization's performance. To achieve this, construction project managers must effectively manage and control project phases, its related activities and resources. Thus, construction organizations in such environments need to develop their traditional project strategies into new, integrated and effective frameworks which require strategic management and human resource competences [13], [14].

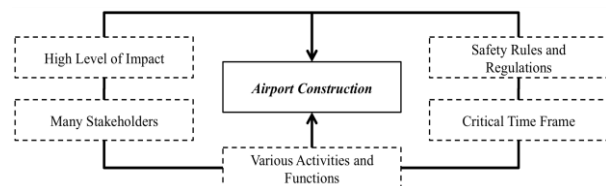


Figure 1. Factors influencing airport construction.

### III. PROJECT STRATEGY AND ITS HUMAN-RELATED FACTORS IN CONSTRUCTION

Clients, developers, prime/sub contractors, designers, key suppliers, government/non-government bodies and regulatory agencies are the typical range of stakeholders involved in large construction projects. In order to successfully manage, control and execute such mega projects, diverse players must effectively and efficiently deal with diversity and confront this challenge [15]. The successful achievement of organizational objectives relies on delivering various projects within a scheduled time frame, budget estimate and expected quality. However, it is argued that the traditional drivers of successful project management are no longer adequate to guarantee project success and eventually reach organizational goals and objectives [16]. Instead, the implementation of effective project management and human-related strategies is the most appropriate approach for the current business environment where most projects are associated complexity and uncertainty [13], [17]. Indeed, project managers who follow traditional ways of managing and executing construction projects often give little attention or even disregard the allocation of human-related factors within their management agendas. Instead, they focus on time, cost, and quality. This behavior will have a significant impact on different expectations, as no project would exist without people inputs.

Hence, with the various challenges and difficulties linked to airport construction, and all the different expectations associated with project outcomes, when an

effective and integrated project strategy exists, an effective and efficient working environment would result. This is dependent upon the project stakeholders and employees at all levels being structured to facilitate effective lines of coherent communication. Accordingly, the integrated interplay between project strategy and its human-related factors is the often overlooked factor of success in strategic project management where managers structure a framework of winning that involves a unique approach to strategic project management practice.

#### IV. RESEARCH THEORETICAL FRAMEWORK

An effective and efficient approach to mitigate specific problems associated with airport construction projects is therefore needed. The proposed research framework is composed of a set of coherent concepts formed from several components and organized in a manner that makes them interact in order to enhance management practices and seek to achieve project success and long-term business goals.

Each component aims to improve one or more aspects that impede the progress of project management and cause certain obstacles. It further breaks down into several sub-modules, which explain the mechanism of applying the main component.

The theoretical framework, as shown in Fig 2, has integrated various existing theories associated with project strategies and strategic human resource management [18]-[24]. This aims to achieve the desired framework which offers possible solutions for airport operator's project managers to implement in order to enhance their performance when managing and controlling their construction projects. A detailed and comprehensive examination of interdisciplinary literature has proposed seven drivers of success, their sub-modules represent the independent variables which may influence the effective and efficient performance and completion of airport construction projects towards success, the dependent variables, the influence of high management performance is moderated by the achievement of several project characteristics, the intervening variables.

Further examination of the framework will be achieved through several case study analyses after exploring/investigating different airport project management experiences in order to refine, modify or restructure its instruments. Those case studies are performed under four different airport ownership structures, therefore, the effects of various ownership forms on improving airport organizations' effectiveness when managing and controlling airport construction projects will be also investigated.

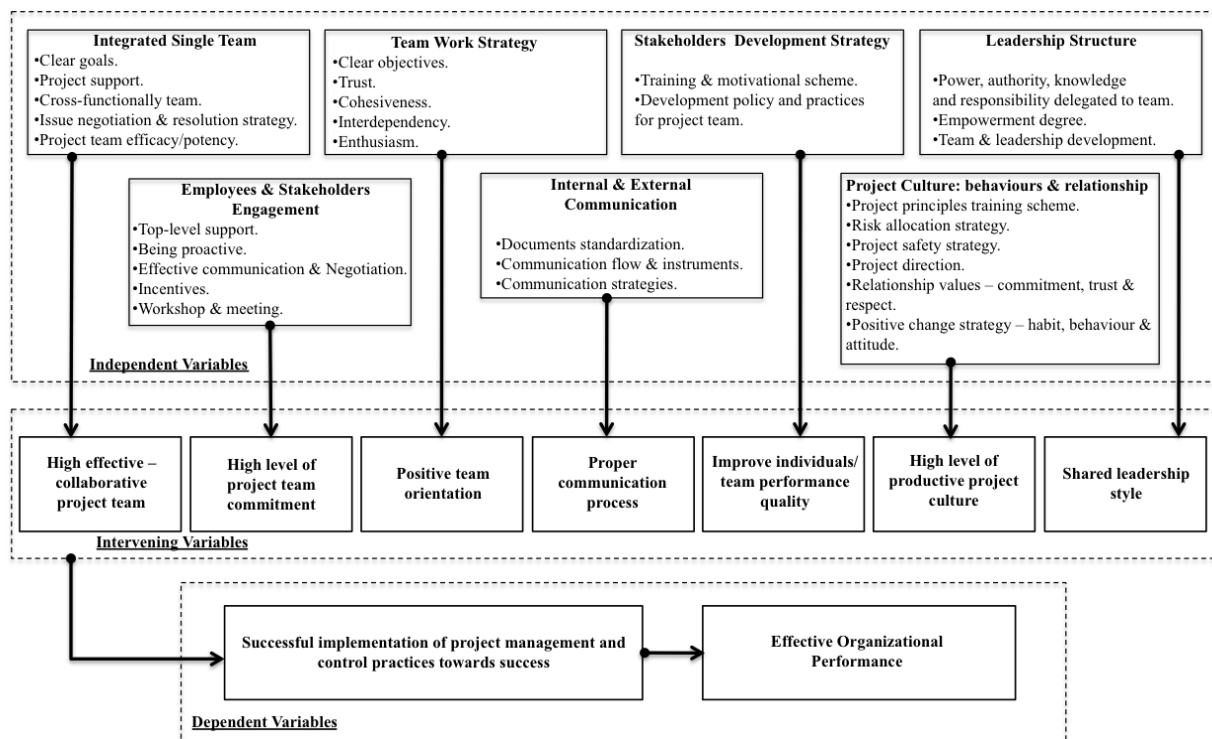


Figure 2. Research Theoretical Framework.

#### ACKNOWLEDGMENT

The current stage of this study could not have been achievable without the supporting, encouragement, guidance and ideas of many people. I would like first to express my special thanks and appreciation to Dr. Allan Osborne, Mr. Glenn Steel and Prof. David Greenwood for

their cooperation. Very special thank to my wife, Mrs. A. Khafaji, for her support, encouragement and assistance. The study benefitted from valuable comments and suggestions from airport operator representatives, senior project managers, from different countries. I am also wish to express my thanks to all people who contributed to achieve this stage of the study.

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