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# THE EFFECTS OF STRATEGIC AND EMPLOYEE FACTORS ON THE PROJECT PERFORMANCE OF IRAQI PUBLIC CONSTRUCTION PROJECTS: THE ROLE OF KNOWLEDGE TRANSFER, EXPERIENCE AND SAFETY



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## ACKNOWLEDGMENT

*“In the name of Allah, the Most Gracious and the Most Merciful”*

Alhamdulillah, first and foremost, praise be Allah, the Cherisher and Sustainer of the World and to the Prophet Muhammad (Peace and Blessings of Allah Be Upon Him) who was sent by Allah to be a great teacher to the mankind.

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## ABSTRACT

The purpose of this study is to examine the effect of strategic and employee factors on the project performance of Iraqi public construction projects. The study also aims to determine the mediating effect of knowledge transfer and the moderating effect of safety and experience. A total of 221 responses were collected from project managers, civil engineers, site managers, and architects. The findings indicated that strategic factor and their dimensions ( $\beta = 0.300$ ,  $t=4.889$ ,  $p<0.001$ ), management support ( $\beta = 0.160$ ,  $t=2.741$ ,  $p=0.006$ ), development of a common philosophy ( $\beta = 0.133$ ,  $t=2.955$ ,  $p=0.003$ ) and decision making ( $\beta= 0.094$ ,  $t=2.128$ ,  $P=0.033$ ) have a significant effects on project performance. Knowledge transfer has no mediating effect on the relationship between strategic factor or employee factors on project performance. The findings also showed that experience of the project manager has a significant positive moderating effect between strategic factors and project performance ( $\beta = 0.206$ ,  $t=2.994$ ,  $p=0.003$ ). Meanwhile, safety is found to have a direct effect on the project performance but has no moderating factors. Overall, this study shows the factors that affect the project performance in Iraqi public construction projects. Decision makers and policy makers in Iraqi have to focus on strengthening the role of strategic factors to enhance the project performance of Iraqi public construction projects.



## KESAN FAKTOR STRATEGIK DAN PEKERJA TERHADAP PRESTASI PROJEK AWAM IRAQ: PERANAN PEMINDAHAN PENGETAHUAN, PENGALAMAN DAN KESELAMATAN

### ABSTRAK

Kajian ini bertujuan untuk mengenalpasti kesan faktor terpilih terhadap prestasi projek awam Iraq. Kajian ini bertujuan untuk mengkaji kesan pengantaraan pemindahan pengetahuan dan kesan penyederhana keselamatan dan pengalaman. Sejumlah 221 responden dikumpulkan dari pengurus projek, jurutera awam, pengurus tapak pembinaan, dan arkitek. Hasil kajian menunjukkan bahawa faktor strategik dan dimensi ( $\beta = 0.300$ ,  $t = 4.889$ ,  $p < 0.001$ ), sokongan pengurusan ( $\beta = 0.160$ ,  $t = 2.741$ ,  $p = 0.006$ ), pembangunan falsafah ( $\beta = 0.133$ ,  $t = 2.955$ ,  $p = 0.003$ ) dan pembuat keputusan ( $\beta = 0.094$ ,  $t = 2.128$ ,  $p = 0.033$ ) memberi kesan signifikan terhadap prestasi projek. Ganjaran didapati sebagai faktor terpenting. Pemindahan pengetahuan tidak mempunyai kesan pengantaraan pada hubungan antara faktor strategik atau faktor pekerja terhadap prestasi projek. Penemuan juga menunjukkan pengalaman pengurus projek mempunyai kesan penyederhana signifikan yang positif antara faktor strategik dan prestasi projek ( $\beta = 0.206$ ,  $t = 2.994$ ,  $p = 0.003$ ). Sementara itu, keselamatan didapati mempunyai kesan langsung terhadap prestasi projek tetapi tidak mempunyai kesan penyederhana. Keseluruhannya, kajian ini menunjukkan faktor-faktor yang mempengaruhi prestasi projek dalam projek pembinaan awam Iraq. Pembuat keputusan dan pembuat dasar di Iraq perlu memberi tumpuan kepada pengukuhan peranan faktor strategik untuk meningkatkan prestasi projek projek pembinaan awam Iraq.





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## LIST OF ABBREVIATIONS

AHP	Analytic Hierarchy Process
AVE	Average Variance Extracted
CA	Cronbach's Alpha
CO	Cost
COM	Commitment to the Project
CR	Composite Reliability
CV	Common Philosophy
DS	Decision Making
D.V	Dependent Variable
EX	Experience
FT	Time
I.V	Independent Variable
KBV	Knowledge Based View
KMO	Kaiser-Meyer-Okin
KT	Knowledge Transfer
MS	Management Support
NIC	National Investment Commission
PLS	Partial Least Square
RBV	Resource based view
QU	Quality
RW	Reward
SA	Safety
SEM	Structural Equation Modeling
SET	Social Exchange Theory



SM	Structural Model
SPSS	Statistical Package for the Social Sciences
TD	Training and Development
VIF	Variation Inflation Factor

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## CHAPTER 1

### INTRODUCTION

#### 1.1 Background of the Study

Construction industry is an important sector that contributes greatly for the economic growth of a nation. It is an investment-led sector where government shows high interest to develop infrastructure related to health, transport as well as education sector. Further, it is essential for the prosperity of any nation (Jarkas, Radosavljevic, & Wuyi, 2014; Santos & Varajão, 2015; Silvius & Schipper, 2015). The construction industry is a competitive high-risk industry (Gudien, Ramelyt, & Banaitis, 2013). Due to the increase in the uncertainties in technology, budget, and development processes, the construction industry became more dynamic in nature and the construction projects have become more complex and difficult to manage (Gudien et al., 2013).

The study of project success and critical success factors (CSFs) is means of understanding and thereby improving the effectiveness of construction projects (Gudien et al., 2013). However, high-profile project failure is regularly reported in the public domain (Idoro, 2009; Mahmood, Asghar, & Naoreen, 2014; Nguyen & Chileshe, 2015). This high rate of failure does not impact the construction industry alone, but its effect reaches out to all other economic sectors. This is because construction industry is considered as one of the main pillars of the economic growth for nations and the growth and state of the affairs of this industry can affect all other economic sectors. Therefore, the success (success and performance are used interchangeably to denote to the same meaning (Zhang & Fan, 2013) of the construction industry in developing its projects can be accounted as a success for other industries as well (Powl & Skitmore, 2005; Tabassi et al., 2016).

Projects in current business environments are considered not only solutions to technical problems but also a way to improve business and to implement changes (Erling, Andersen & Jessen, 2003). One of the tools that are widely used in projects is the project management, which is designed to ensure the success of a project. Project success is a subjective concept that depends on the perspective of the individual who is evaluating this success (Nahod & Radujković, 2013; Cserhádi & Szabó, 2014; Berssaneti & Carvalho, 2015). Traditionally, compliance with cost, schedule, and quality has been used as a criterion to measure project success (Berssaneti & Carvalho, 2015; de Carvalho, Patah, & de Souza Bido, 2015). These dimensions, known as the “iron triangle”, and they are still considered the most important standard for measuring project success (Papke-Shields, Beise, & Quan, 2010). The iron triangle is a measurement of the project success that determines the success to be linked to



time, cost, and quality. It is widely used in the project success literature (Papke-Shields et al., 2010).

Failure is considered the opposite of success and understanding the failure leads to better success rate of project (Thomas & Fernández, 2008; Taherdoost & Keshavarzsaleh, 2016). To better understand the causes of project failure, researchers explored a number of project management dimensions, including how projects are conducted and the internal and external contexts in which projects are executed (Papke-Shields et al., 2010). For example, factors of delay were related to client related factors, contractor related factors, consultant related factors, and external factors (Albogamy, Scott & Dawood, 2012) or owner administration, early planning and design, government regulation, site and environmental condition, and site supervision (Al-Ghafly, 1995). Parties also blame each other for the delay. For example, contractors accuse owners and consultants to cause the delay and owner and consultants accused the contractors (Al-Khalil & Al-Ghafly, 1999).

Successful projects were the center of attention of researchers. Several authors have used different lines of research to identify the variables or conditions that lead to successful projects. Among these lines of research, the greatest number of publications is related to critical success factors (Müller & Jugdev, 2012; Ofori, 2013; Chou & Pramudawardhani, 2015; Yalegama, Chileshe, & Ma, 2016) and project management maturity models (Zhang & Fan, 2013; de Carvalho, Patah, & de Souza Bido, 2015; Petro & Gardiner, 2015). The current business environment shares the general assumption that the adoption of project management methodologies driven by international bodies of knowledge (BOKs) and the achievement of maturity in this





field result in improvement of both organizational performance and project performance (Berssaneti & Carvalho, 2015).

Previous studies have limitations regarding the number of respondents in quantitative studies. Number of respondents in the majority of previous studies is limited between 40-50 respondents (e.g. Hyvari, 2006; Lu & Yuan, 2010; Chileshe & Haupt, 2012; Gudien, Ramelyt & Banaitis, 2013). In addition, the majority of previous studies was conducted in developed countries such as United Kingdom (UK), Norway, US, France, Germany, and Australia and focused more on factors that reflect the situation in these countries (Davis, 2016; Gepp, Hellmuth, Schaffler, & Vollmar, 2014) while in developing countries such as Iraq, few of the previous studies was conducted on this country. Furthermore the success rate of projects in developing countries is very low at 20% (Albogamy et al., 2012; Assaf & Al-Hejji, 2006).

Accordingly, the purpose of this study is to conduct an exploratory study to identify the factors that affect the success of projects and to move further to conduct a confirmatory study to confirm the effectiveness of these factors for performance of projects in public projects in Iraq.

## 1.2 Problem Statement

Failed project in the public sectors were reported in the last three years in Iraq (Al-Monitor, 2016). Incidents such as a wall of a school collapsed, withdraw a highway project from the contractor, licenses of companies were taken away by the local government are evidence of weak performance of Iraqi construction public project





(Al-Moniter, 2016). As a result, the need arises to study the success factor to improve the performance of public project in the country. As a proposed solution, studies have been conducted to identify the success factors and provide recommendations to the decision makers. However, the literature is explorative in nature and few studies have been conducted on developing countries, which have low percentage (20%) of project success (Assaf & Al-Hejji, 2006; Albogamy et al., 2012; Damoah & Kumi, 2018).

Few of previous studies investigated the causality between the CSFs and the project performance (Chan, Scott, & Chan, 2004; Yu & Kwon, 2011; Müller & Jugdev, 2012; Alias, Zawawi, & Yusof, 2014). Further, few studies employ theories to support the development of their approach toward project success. Previous studies depended on the literature review to extract factors and then evaluate these factors using experts or contractors, and clients' perspectives. However, recently, researchers called for deploying theories such as Knowledge based View (KBV) and Resource Based View (RBV) to support the theoretical development of project success (Badewi & Shehab, 2016).

Previous studies showed that there is a lack of empirical and structured researches to address the relationship between project management and performance (Berssaneti & Carvalho, 2015; de Carvalho et al., 2015; de Carvalho et al., 2015). The majority of the previous studies are exploratory in nature and followed similar approach to identify the factors that affect the success of project using factor analysis approach (e.g. Aksorn & Hadikusumo, 2008; Buvik & Rolfsen, 2015). There is a need to investigate the performance of projects using a confirmatory quantitative approach (Berssaneti & Carvalho, 2015).





Few of previous studies employ theories to support the development of their approach toward project success or performance. The use of organizational theories such as the Resource Based-View (RBV) in understanding the governance of project management practices and its actors' interactions within the organization has not so far been fully understood (Greenwood & Miller, 2010; Badewi & Shehab, 2016). The RBV has been one of the dominant approaches in the strategy literature. On the other hand, the RBV of the firm has been used in a few empirical studies in the area of project success and performance (Wright, Dunford, & Snell, 2001). Project management is a new field that is a long way from developing its own theory, therefore, it draws from the field of management (Koskela & Howell, 2002). The project management literature review revealed few empirical studies on project management as a strategic asset (DeFillippi & Arthur, 1998), and there are few empirical studies on knowledge management in the project management context (Lj Todorović et al., 2015; Loforte Ribeiro et al., 2010).

The performance and/or success of project has been investigated intensively in the developed countries (e.g. Bryde, 2008; Frödell, Josephson, & Lindahl, 2008; Fapohunda, 2014; Hussein, Ahmad & Zidane, 2015; Badewi & Shehab, 2016), while the studies related to the developing countries in general and to Iraq in particular are limited. In addition, despite the support from existing theories such as KBV and RBV to the role of strategic resource and employees' related factors as well as to the role of knowledge in improving the performance, few studies have incorporated strategic and knowledge factors into their studies.







As a result, there is urgent need to investigate the factors that affect the success and/or performance of project in Iraq. Consequently, this study investigates these factors and provides the decision makers with suggestions that can improve the performance of project and increase the success of construction public projects in Iraq.

### 1.3 Research Objectives

The main objective of this study is to determine the factors that affect the performance of Iraqi public construction projects. Specifically, this study aims to fulfill the following objectives:

- 1- To determine the effect of strategic related factors on the project performance of Iraqi public construction projects.
- 2- To determine the effect of employee related factors on the project performance of Iraqi public construction projects.
- 3- To investigate the mediating role of knowledge transfer between strategic related factors and employee related factors, and project performance of Iraqi public construction projects.
- 4- To investigate the moderating effect of project manager experience between strategic related factors and project performance of Iraqi public construction projects.
- 5- To investigate the moderating effect of safety between employee factors and the project performance of Iraqi public construction projects.
- 6- To develop a model that can be used as a reference to improve the performance of Iraqi construction public project.





## 1.4 Research Questions

The research question of this study is as follows:

- 1- What are the effect of strategic factors and its dimensions (management support, development of common philosophy, decision making) on the project performance of Iraqi construction public project?
- 2- What are the effect of employee related factors and its dimensions (training and development, commitment to the project, rewards) on the project performance of Iraqi construction public project?
- 3- Does knowledge transfer mediate the relationship between strategic related factors and employees related factors, and project performance of Iraqi construction public project?
- 4- Is there any moderating effect of project manager experience on the effect of strategic related factors on the project performance of Iraqi construction public project?
- 5- Is there any moderating effect of safety between employee related factors and the project performance of Iraqi construction public project?
- 6- Can a model be developed to be used as a reference to improve the performance of Iraqi construction public project?

## 1.5 Significance of the Study

This study is significant due to several reasons. From the theoretical perspective, this study enriches the body of knowledge related to the success and performance of





project. The literature on project success is dominated by exploratory studies and there is a need to implement theories such as RBV in understanding the project success and performance (Badewi & Shehab, 2016). It has been also noted that empirical work to investigate project management practices in developing countries is relatively less than developed countries (McHugh & Hogan, 2011). Thus, this study contributes to the literature by conducting confirmatory study and using theories such as Knowledge Based View, Resource Based View, Maslow of Hierarchical Need Theory, and Social Exchange Theory to support the success and performance of projects.

This study is also significant because it contributes to the nation, business companies, and citizens. To the nation, the study provides the factors that affect the project success so that the decision makers can use the findings of this study to reduce the wastage of public fund in failure project. The saved fund can be used in other projects that can bring prosperity to the nation. To business companies, knowing these factors reduces significantly the delay and additional operational costs resulted from the delay in completing the projects on the specified time, cost, and quality. To citizens, this study is important because it leads to better project in term of quality and cost and it reduces the delay time so that citizens can enjoy the utilization of public facilities such as schools and universities or hospital instead of crowding at those operational ones.





## 1.6 Scope and Limitation of the Study

This study is conducted in Iraq. The study investigates the factors that affect the project success and performance. The study focuses mainly on construction public projects such as schools, universities, hospitals, and housing related to government. Private projects are not part of this study. In addition, the study collects data from those are working in public construction projects. Employees at private projects are not included in this study.

Data of this study is collected from managerial level at projects. This includes site manager, engineers, project manager and those who are in the management level. Owners of the projects, workers and customers are not included in this study. This is because the managerial level of the projects is more familiar with the factors investigated in this study, while workers and owners might not be fully aware of project management concepts and approaches.

The study investigates the success factors of projects. However, delay factors are considered the opposite of success and they are included in this study. In addition, the performance of project is used interchangeably with project success. Lastly, the study utilizes the theory of RBV, Maslow hierarchical need, KBV, and social exchange theory; other theories are not included in this study.

There are some limitations of this study related to sampling approach and technique. Due to the fact that this study focuses on public project and investigates factors related to the project management, strategic management, and knowledge





management, only employees with managerial level will be aware of these factors. Thus, the study is using the purposive sampling techniques. This has limited the generalizability of the study.

## 1.7 Definitions of Operational Terms

It is in the interest and contention of the writer that reader (s) has a brief and sound understanding of the operationally defined key concepts and phrases used in this study before making meaning out of the objectives and research questions. The key words and phrases are as follow:



### 1.7.1 Project

A project is temporary in that it has a defined beginning and end in time, and therefore defined scope and resources (Project Management Institute, 2013). In this study, project refers to the construction public projects such as houses, schools, highways, bridges that are part of the infrastructure amenities being developed in Iraq.

### 1.7.2 Project Management

Project management is defined as the process of controlling the achievement of the project objectives and utilizing the existing organizational structures and resources. It seeks to manage the project by applying a collection of tools and techniques, without adversely disturbing the routine operation of the company (Munns & Bjeirmi, 1996).





In this study, project management is defined as a method that can be used by managers to achieve the project on time and within the agreed cost and quality.

### **1.7.3 Project Performance/Success**

Project success or good performance is stated in terms of meeting three objectives: 1) completed on time, 2) completed within budget, and 3) completed at the desired level of quality (Kerzner, 2009). In this study, the term project success refers to a state of completion of the project in the specified time, cost, and with the desired quality.

### **1.7.4 Project Delay/failure**



In this study, the project delay or failure is the opposite of project success.

Accordingly, the failure in achieving one of the three objectives of project specified by Kerzner (2009). A project is considered failure when it failed to be delivered at the specified time. It is also considered failure when it is delivered not within the specified cost or quality.

### **1.7.5 Strategic Factors**

Chileshe and Haupt (2012) considered the strategic factors are those related to the strategic direction of the organization. In this study, strategic factors refer to the factors that are related to the management of organizations such as the top management support, the development of common philosophy, and the decision making.





### 1.7.6 Employee Factors

Alias et al. (2014) refers to employee factors or human factors are the factor that is affected by human behavior. In this study, employee related factors refer to the factors that affect the employee performance such as training and development, commitment to the project, and the rewards that they obtain for their performance.

### 1.7.7 Management Support

Management support is defined as the willingness of top management to provide the necessary resources and authority for project success (Ofori, 2013). In this study, management support refers to the financial, logistic, and all types of support that the management can provide to make the project a success.

### 1.7.8 Development of a Common Philosophy (Common Philosophy)

Common philosophy and project mission are used interchangeably in this research. It is defined as the initial clarity of goals and general direction (Ofori, 2013). In this study, it is defined as the spreading of common goals, mission, vision, and philosophy among employees toward achieving the project objectives.





### **1.7.9 Decision Making**

Decision making is defined as the thought process of selecting a logical choice from the available options (Goh, 2016). In this study, it is defined as the ability to make the right decision that leads to better project performance.

### **1.7.10 Training and Development**

Training and development is defined as the degree to which an employee receives additional knowledge to enhance his or her skills and capabilities and to be entitled for promotion in his or her career ladder (Khan, Khan, & Khan, 2011). In this study, it is defined as the ability of the organization to provide employees with the needed training that helps them to perform their work and the chance for employees to get promoted in the career ladder based on their performance and skills.

### **1.7.11 Commitment to the Project (Commitment)**

Commitment to the project is defined as the dedication and interest of employee in the project to complete the project within the specified time, cost and quality (Toor & Ogunlana, 2008). In this study, commitment to the project is the extent to which employees feel that they are part of the project and the success of the project is considered their success.





### 1.7.12 Rewards

Rewards refer to the monetary or non-monetary benefits that the employees gain from the organisations (Waqas & Saleem, 2014). In this study, rewards are defined as the monetary benefits that employees and involved parties in a project can gain once the project completed within the specified criteria.

### 1.7.13 Knowledge Transfer

Knowledge transfer refers to sharing or disseminating of knowledge and providing inputs to problem solving (Paulin & Suneson, 2012). In this study, it refers to the practice of sharing knowledge, idea, expertise, and helping others to learn new skills.

### 1.7.14 Experience of Project Manager

Experience is defined as the knowledge or skill acquired by a period of practical experience of something, especially that gained in a particular profession (Bredillet, Tywoniak, & Dwivedula, 2015). In this study, experience is defined as the knowledge of the project managers in dealing with the project activities and task and making decisions that lead to better project performance.

### 1.7.15 Safety

Bubshait and Almohawis (1994) define safety as the degree to which the general conditions promote the completion of a project without major accidents or injuries. In



this study, safety is extended to include the safety on the project site and in the external environment such as safety from explosion in some targeted area in Iraq.

## **1.8 Organization of the Thesis**

This study consists of five chapters. A description of the contents of the five chapters is given as follows:

### **Chapter 1: Introduction**

This chapter provides background information about the topic and the issues that are related to this study. The chapter also formulates the problem statement and states the objectives as well as the research questions. Further, the chapter highlights the significance of the study and specifies the scope of this study. The chapter provides the operational definitions of the terms that are used in this study. Lastly, the chapter discusses the contents of this study and summarizes the first chapter of this study.

### **Chapter 2: Literature Review**

This chapter focuses on the review of the related literature. Project success is reviewed, discussed and analyzed. Theories of RBV, KBV, social exchange theory, and Maslow hierarchical needs are discussed. A total of 47 articles related to project success, project management, and project failure are discussed. A frequency analysis is conducted to identify the most frequent factors in the literature. Evaluation by



experts is conducted and the most related factors are used to develop the conceptual model of this study. Based on the literature, the hypotheses of this study are developed.

### **Chapter 3: Methodology**

This chapter discusses the research methodology of this study. The chapter presents the research design as well as the research population and sampling. Next, the chapter discusses the instrument of data collection followed by the validity and reliability. Data collection process and data analysis are discussed.

### **Chapter 4: Data Analysis and Findings**

This chapter presents the findings of this study. The chapter first describes the background information of the respondents. Preliminary analysis such as missing value, outliers, normality, and multicollinearity are conducted to ensure that the data is ready for further analysis. The exploratory factor analysis is conducted in this chapter using SPSS. This is followed by the measurement model and structural model using the Partial Least Square (PLS). Hypotheses testing of this study are given in this chapter.

### **Chapter 5: Discussions, Conclusion and Recommendations**

This chapter provides the discussion of the findings of this study with the findings of previous studies. The chapter also provides the theoretical and practical implication of



this study. In which the recommendation for decision makers are given to improve the project performance of Iraqi public construction projects. Limitation of this study is highlighted and the direction for future work is elaborated. Finally, the conclusion of this study is given.

## 1.9 Summary

This chapter has presented the background of this study. The chapter mainly focused on the importance of project success and the issue related to the project success or failure in Iraq. The chapter formulated the problem statement of this study and stated the research objectives and research questions. The significance of the study was discussed along with the scope of this study. Definition of the variables and the terms that are used in this study are given. The organizations of the study, which include a description of the five chapters, were highlighted and a summary of the chapter was given.

