

INTEGRATED INFLUENTIAL FACTORS (IIFs) MODEL OF INTERNAL
STAKEHOLDERS AS AN ADAPTIVE CONTROL SYSTEM TO CURB PROJECTS
COMPLETION DELAY IN YEMEN

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I dedicate this thesis to my dear and beloved parents for their uncommon support, perseverance, encouragement and prayers, despite the hard times they went through, which gave me the strength to withstand the obstacles I went through during my academic journey. To my precious darling wife, my dear children and siblings who supported and stood by me I say a big thank you for being there.



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ABSTRACT

The construction industry usually encounters lingering problems particular to time delay which is a major concern that affects project completion time globally. Influential factors causing delays in construction projects completion differ among countries, due to differing prevailing conditions that exert an influence on construction project delivery. In Yemen and other developing countries, many projects experience extensive delays by exceeding their initial completion time thereby leading to several reported effects which among others include: cost overrun; litigation; arbitration; failure; and abandonment. In order to mitigate these effects, a prevailing approach that is reported to being implemented is enhancing the collaboration of stakeholders in construction project delivery. This study seeks to propose an Integrated Influential Factor (IIF) model of internal stakeholders with a view to prevent delay in construction project delivery. A questionnaire survey was carried out among owners, consultants and contractors. A total of 301 questionnaires were collected of which 283 responses were found valid. Analysis of Moment Structures Equation Modelling (AMOS-SEM) model was developed based on 7 groups related to internal stakeholders of construction projects which are: consultant influential factors; contractor influential factors; owner influential factors; sub-contractor influential factors; designer influential factors; supplier influential factors; and labour influential factors. The findings from the IIFs model indicate that out of these 7 groups studied, while contractor, owner, subcontractor, designer and supplier have significant effect on delay, consultant and labour were not supported. Based on the path co-efficient value however, the most significant category is 'contractor influential factors'. The implication of this research, it could enhance the integration of internal stakeholders and expect to be drastically eliminate the fear relative to project time delay of construction project delivery.

ABSTRAK

Industri pembinaan di peringkat global sentiasa menghadapi masalah kelewatan yang memberi kesan kepada masa penyiapan projek. Faktor kelewatan penyiapan projek pembinaan berlainan antara negara-negara disebabkan perbezaan kaedah penyampaian. Kebanyakan projek pembinaan di Yaman dan negara-negara membangun mengalami masalah kelewatan disebabkan oleh beberapa faktor iaitu: kos melebihi peruntukan; tindakan undang-undang; timbangtara; kegagalan; dan pemberhentian. Peningkatan kerjasama pihak dalaman yang berkepentingan adalah antara usaha yang boleh mengurangkan kesan ini. Kajian ini bertujuan mencadangkan satu model *Integrated Influential Factors (IIFs)* bagi pihak dalaman yang berkepentingan untuk mengelak kelewatan projek pembinaan. Tinjauan soal selidik telah dijalankan terhadap pemaju, perunding dan kontraktor. Sebanyak 301 set borang telah dihantar dengan sebanyak 283 maklum balas telah diterima. *Analysis of Moment Structures Equation Modelling (AMOS-SEM)* telah digunakan berdasarkan pembangunan 7 kumpulan pihak dalaman yang berkepentingan iaitu: faktor mempengaruhi perunding; faktor mempengaruhi kontraktor; faktor mempengaruhi pemilik; faktor mempengaruhi sub-kontraktor; faktor mempengaruhi pereka; faktor mempengaruhi pembekal; dan faktor mempengaruhi buruh. Penemuan model IIFs menunjukkan bahawa 7 kumpulan iaitu kontraktor, pemilik, subkontraktor, pereka dan pembekal masing-masing mempunyai kesan besar disebabkan kelewatan, namun pihak perunding dan buruh adalah sebaliknya. Saiz kesan kelewatan 7 kumpulan tersebut adalah sederhana daripada R^2 (pekali penentuan). Kategori yang paling terkesan terhadap faktor kelewatan ialah pihak kontraktor. Implikasi kajian ini ialah dapat meningkatkan integrasi pihak dalaman yang berkepentingan dan diharap dapat mengelak kelewatan penyampaian projek pembinaan secara drastik.

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LIST OF ABBREVIATIONS

PCD	Project Completion Delay
GDP	Gross Domestic Product
IIF	Integrated Influential Factors
SEM	Structural Equation Modelling
NGOs	Non-Governmental Organisation
SRI	Stanford Research Institute
PMI	Project Management Institute
PMBOK	Project Management Body of Knowledge
SPSS	Statistical Package for Social Sciences
RII	Relative Importance Index
CONSIF	Consultant Influential Factors
CONTIF	Contractor Influential Factors
OWNRIF	Owner Influential Factors
DESIF	Designer Influential Factors
SUBIF	Sub-Contractor Influential Factors
SUPIF	Supplier Influential Factors
LABIF	Labour Influential Factors
PCD	Project Completion Delay
CR	construct reliability
AMOS	Analysis of Moments Structures
CFA	Confirmatory Factor Analysis
AI	Average Index
NS	Not Significant
SS	Slightly Significant
MS	Moderately Significant

VS	Very Significant
ES	Extremely Significant
EM	Expectation maximization
VIF	variance inflation factors
EFA	Exploratory factor analysis
AVE	Average Variance Extracted
GFI	Goodness-of-Fit Index
REMSEA	Root Mean Square Error of Approximation
TLI	Tucker-Lewis Index
CFI	Comparative Fit Index
NFI	Normed Fit Index
ChiSq/df	Chi-Square/Degree of Freedom



PTTA UTHM
PERPUSTAKAAN TUNKU TUN AMINAH

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PERPUSTAKAAN TUNKU TUN AMINAH

CHAPTER 1

INTRODUCTION

This chapter begins by presenting the research background. Afterwards, the research problem is articulated, the research questions asked, the research aim stated with its accompanying research objectives. Furthermore, the research scope is contextualised and the significance of research postulated. Subsequently, the research hypotheses are also presented which have been designed around the research questions and objectives which are in dimensions for evaluation of the effect of internal stakeholders on Project Completion Delay (PCD).

1.1 Research background

Project Completion Delay (PCD); also termed to as time overrun) is a global phenomenon in the construction industry. In other words, very rarely are projects finished within the approved scheduled date. Although PCD is an associated project challenge that occurs in nearly all projects, its impact varies across projects (Alsharif & Karatas, 2016). This is consistent with the findings of several researchers. For instance, Jackson (2002) and Olawale & Sun (2010) both reported that nearly one third of client's in the UK complain that their projects generally overran due to delay. Although PCD in this instance is reported as an issue in a developed country like UK, researches have shown that PCD occurs extensively in developing countries. For instance, Azhar *et al.* (2008) reported that the problem of PCD in construction projects sometimes exceed 100% of the anticipated time. Likewise, Flyvbjerg *et al.* (2003) report that 9 out of 10 projects face problems of PCD in Denmark. Furthermore, Ahmed *et al.* (2015) pointed out that 47% of construction projects in

Yemen suffer from time delay and 40% of the total projects experienced cost overrun also. Albogamy *et al.* (2013) describes delay as a key issue in the construction industry globally and in the Middle East in particular and revealed that in the Middle East region not less than 70% of public sector construction projects have failed to be completed within scheduled time and dedicated budget. While this is rather general, construction projects in Yemen in particular experience widespread PCDs.

Accomplishing construction projects within the time specified is seldom achievable in Yemen. The funds allocated for the projects are not properly utilized as well. Consequently, many large construction projects in Yemen are either delayed, suspended or abandoned. Some of the abandoned large construction projects in Yemen include the renovation of Aden General Hospital, the construction of new Cardiac Centre. A total of US\$ 29 million was approved for these projects (Yemenpress, 2014). Similarly, the Orphan Children Hospital Project with the total cost of the project of US\$ 40 million. Dollars, Yemeni Parliament Building with a total cost of 30 million U.S. dollars (Yemenpress, 2014) and the New Sana'a International Airport Project with a total cost of at US\$ 500 million. Dollars (Yemenpress, 2014) are all suspended. Delays, cost overrun and failure in projects completion are indeed becoming an endemic and a recurrent phenomenon in Yemen (Issa *et al.*, 2015; Sultan, 2005).

It must be noted that delayed projects amount to huge losses for states, corporate bodies and individuals. Additionally, this can result in loss of investments, failure of companies, and recourse to the judiciary to resolve disputes (Jammaz, 2010). All these are not only detrimental to the projects but also everyone who has a stake in the project. Hence, PCD is indeed a major issue of concern among any stakeholder in the construction industry. This can be confirmed by the claim of (Aziz, 2013) that PCD adversely affects all stakeholders of projects inclusive of owners, design professionals, construction professionals, users and others. There exist several studies that have attempted to address PCD from the context of stakeholders. Such stakeholder approach has been instrumental in suggesting that enhancing the relationships with stakeholders and incorporating their concerns into a corporation's strategy might improve its competitiveness (Barney, 1991; Surroca *et al.*, 2010). Maintaining manageable proportions and partnerships in the dialogue between (and among) corporations and construction agencies has become a method of implementing extended stakeholders' management (Perry and Singh, 2001,

Vachon and Klassen, 2008). Hart (1995, Plaza-Úbeda *et al.*, 2010, Milad *et al.*, 2016) highlighted stakeholders' integration as a key resource to pre-empt competitiveness of the corporation. Addressing stakeholder interests is critical for a corporation's success (Donaldson and Preston, 1995; Greenley and Foxall, 1998). Corporations should know their stakeholders, interact with them and adapt corporate behaviours towards the interests of the stakeholders. In other words, corporations should integrate their stakeholders' interests into the corporations' concerns. By doing so, corporations can achieve strategic capabilities that are firm-specific and support their competition position (Grant, 1991; Sharma and Vredenburg, 1998).

The concept of stakeholder integration refers to the ability to establish a positive collaborative relationship with a wide variety of stakeholders (Plaza-Úbeda *et al.*, 2010; Rueda Manzanares *et al.*, 2008; Sharma and Vredenburg, 1998). Accordingly, stakeholder integration in this study refers to the ability of the corporations to make active communications with their stakeholders with regards to construction industry projects and behave in line with the interests of the stakeholders. Interaction with stakeholders is an indispensable task of the corporation with respect to its relationship with stakeholders (Polonsky and Wood, 2001). Although the knowledge of and the interaction with stakeholders are important steps in the corporation's integration of stakeholders, those steps cannot represent the full integration without behaving in line with the interests of stakeholders. It has been argued that aligning behaviour with stakeholder interests is a critical element in satisfying stakeholders (Plaza-Úbeda *et al.*, 2010; Polonsky and Wood, 2001) and in determining the level of stakeholder integration (Plaza-Úbeda *et al.*, 2010). They emphasised that the existence of this behaviour is an indicator of the true integration of stakeholders. Therefore, the full integration of internal stakeholders refers to the ability of the corporation to operate consistently with the interests of its stakeholders. The ability of the corporation to manage its relationships with its stakeholders can be a determinant of project success (Bayoud *et al.*, 2012).

1.2 Problem statement

There exist reports on the probable causes of PCD. For instance, according to Doloji *et al.* (2012) causes of PCD include: slow decision from client, poor labour

productivity, architects' reluctance for change and rework due to mistakes in construction. Likewise, Heravi (2014) cited that factors associated with stakeholders or managerial constraints to being considered among the most fundamental and important causes of PCD in construction projects. Similar to these reported causes, PCD is also reported to have yielded several negative effects to a construction project. PCD affects the development of the construction industry in particular and the overall economy of countries in general (Senouci *et al.*, 2016; Van *et al.*, 2015; Hamzah *et al.*, 2011). Similarly, PCD results in disputes between the owner and contractor of a project when issues leading to additional cost of the project arise (Samarghandi *et al.*, 2016; Aziz & Abdel-Hakam, 2016; Van *et al.*, 2015). Furthermore, PCD has the potential to result to loss of productivity, loss of time, increasing the cost, claims or sometimes termination of contracts (Al-Hazim *et al.*, 2017; and Tumi *et al.*, 2009). When delay occurs, it endangers the objectives of the project and results in the allocation of more time which leads to additional overheads that cause increments to the overall cost of the project (James *et al.*, 2014).

Based on the afore-presented effects, PCD is of critical significance to the profitability of most construction projects. Sadly, however, (Batool and Abbas, 2017; Gardezi *et al.*, 2014). Aziz (2013) argues that little effort has been made to curtail the occurrence of PCD in project execution. Such obtain in developing countries (like Yemen), whereby PCD is a frequent phenomenon (as confirmed by Marzouk & El-rasas, 2014). Although efforts have been made to identify and evaluate factors affecting the successful completion of construction projects over the last decade (as can be found in the works of (Iyer & Kumar, 2016; Marzouk & El-rasas, 2014; Doloi, 2013; Al-Dairi, 2011) stresses that a deeper understanding of the nature of these factors affecting project completion is still much required. Although the effects of PCD include time overrun, cost overrun, disputes, arbitration, litigation, and total project abandonment have been researched upon (as evident in the works of Doloi *et al.* (2012); Hwang *et al.* (2012) and Omran *et al.* (2012)), little attention is given to the effects of integrating influential factors of project stakeholders' on successful project delivery both globally and in the construction industry of developing nations. The importance of such segment can be confirmed by arguments of (Verbeke and Tung, 2013) that an organization's advantages are basically dependent on its capability to adequately manage stakeholders. Similarly, Li *et al.* (2013); Stoney and Winstanley (2001); and Freeman (1984) are all of the opinions that the stakeholder

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