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An Investigation into the Risk of Construction Projects Delays in the UAE

Omayma Motaleb, The Scott Sutherland School of Architecture and Built Environment, Robert Gordon University, Aberdeen, UK

Mohammed Kishk, The Scott Sutherland School of Architecture and Built Environment, Robert Gordon University, Aberdeen, UK

ABSTRACT

The growing rate of delays in project delivery is considered a major criticism of the construction companies in the United Arab Emirates (UAE). This paper aims to investigate the causes and effects behind the delays pertaining to delivery of construction projects in the UAE. The study is exploratory in nature, and incorporates a pilot questionnaire survey and interviews. An extensive literature review indicates potential factors that have possible effects on construction completion delay. The questionnaire forms were sent to 50 construction companies. Thirty-five (70%) completed responses were received. Analysis of the survey data has revealed that about 42 potential causes and effects of delay relate to various groups of stakeholders. The results show the top fifteen factors relate to clients, project managers and finance aspects. It was found that cost and time overruns are the most significant effects. These results are in partial agreement with previous studies. The paper argues that the key determinant in ensuring project control is on-time project delivery. The results of the study can provide moderate support for a suggested hypothesis, through a framework of project success factors. It should be of high concern to knowledge managers in various roles and decision-makers.

Keywords: Client, Construction Project Success Factors, Delay Risk, Knowledge Management, United Arab Emirates (UAE)

INTRODUCTION

Construction delay is ubiquitous in construction business, as well as being one of the most common risks to project success. This phenomenon largely overlaps the roles and interests of various project stakeholders in a multicultural society. Construction delay can be defined as the time overrun either beyond the contract deadline or beyond the date on which the parties agree upon for the delivery (Assaf & Al-Hajji, 2006). Project success is considered to have been achieved when it is completed within time, cost, on specification and to stakeholders’ satisfaction (Majid, 2006). Delay is considered a frequently recurring problem in many develop-
ing countries, especially those that have grown so quickly despite the recent financial crisis, for example, the UAE construction sector (Faridi & El-Sayegh, 2006; Motaleb, 2009).

Many researchers have classified the causes of construction project delay by stakeholders in groups like clients, contractors, consultants, project managers, resources (such as labor, materials, equipment), external and financial/economic factors (Odeh & Battaineh, 2002; Ahmed et al., 2003; Assaf & Al-Hajji, 2006; Faridi & El-Sayegh, 2006; Motaleb, 2009). The literature is extensive on this phenomenon. An investigation into selected global research in Table 1 and Table 2 has supported the way forward and future work for UAE construction projects. They have been classified into public and private sectors according to causes of group/category. It is reported as full/partial agreements beyond the studies, between 2000-2010 to identify gaps in knowledge.

**Causes of Delay**

The causes are grouped into 10 categories, relating to various stakeholders and factors, namely, i consultant, ii contractor, iii client, iv project managers, v financial, vi resources, vii contractual, viii governmental, ix designer, and external factors. This has encouraged the authors to outline the abstract of causes, to build the foundation of the methodology of construction project delay in the UAE and has helped in the development of a questionnaire.

As shown in Table 1 and Table 2, we exposed the most significant causes of delays in different periods of time and defined them geographically. Investigation into project sectors has been considered, as well as public and private sectors. Some interesting observations have been raised in the risks of delay in construction projects, to analyze the outcomes from each category-related delay. Each category has been highlighted with either low or high exposure, and the most significant factor is related to the **Client**, by excessive change orders, lack of experience and slow-decision making (Al-Momani, 2000; Odeh & Battaineh, 2002; Aibinu & Jagboro, 2002; Ahmed et al., 2003; Koushki, 2005). This view is supported by Wiguna and Scott (2005), Abdu-Rahman et al. (2006), Assaf and Al-Hejji (2006), Faridi and El-Sayegh (2006), Fong et al. (2006), Sweis et al. (2008), Motaleb (2009), and Al-Nuaimi et al. (2010). The next significant factor is financial problems, possibly coinciding with the recession, such as poor cash flow and funding programme constraints, payments delays, and debt problems that are related to the economic situation (Alaghbari et al., 2007; Sweis et al., 2008; Long, 2008; World Bank Iraq Trust Fund, 2008; Motaleb, 2009; Abdul-Rahman et al., 2009; Asnaashari et al., 2009; Kaliba et al., 2009; Khoshgoftar et al., 2010; Yang, 2010). Project managers can be the cause of time delays, in terms of poor planning, poor coordination, site management, inadequate time estimation and lack of team communication (Elinwa & Jashwa, 2001; Odeh & Battaineh, 2002; Fong et al., 2006; Faridi & El-Sayegh, 2006; Alaghbari et al., 2007; Sweis et al., 2008; Motaleb, 2009; Tumi et al., 2009; Kaliba et al., 2009; Khoshgoftar et al., 2010).

A research proposal has been developed along the lines of Morris’s work (1994), who considered construction as an industry that should be placed in project management methodologies at various life-cycle stages as a *mature user*. The previous research shown in Table 1 highlights different projects that have dealt with different views, such as the cases of socially related effects of construction delays on the investors/developers, or any other stakeholders. The perspectives have been built up depending on the nature of each country. Therefore, differences in factors involved in the delays would explain the reason why the same projects could be considered successful by one factor and unsuccessful by another one. The criteria of project success should be considered according to different cultures and environments. For example, causes of delays in the USA were due to improper project management in relocations, procedures and fund programmes (Ellis & Thomas, 2002). In the UK, it is reported that the changes due to
**Table 1. Summary of global research (2000-2010)**

<table>
<thead>
<tr>
<th>No</th>
<th>Research</th>
<th>Project</th>
<th>Factors (Groups) causing delay</th>
<th>Effects of delay</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Al-Momani, (2000)</td>
<td>Public buildings, (Jordan), <strong>Public sector</strong></td>
<td>Designer, External, Finance, Client, Contractor</td>
<td>Time overrun</td>
</tr>
<tr>
<td>3</td>
<td>Elinwa and Jashwa, (2001)</td>
<td>Public works (Nigeria), <strong>Public sector</strong></td>
<td>Finance, Resources, Designer, Project Manager, Contractor, Government</td>
<td>Time &amp; cost overrun</td>
</tr>
<tr>
<td>5</td>
<td>Ellis and Thomas, (2002)</td>
<td>Highway (USA), <strong>Public sector</strong></td>
<td>Project Manager, External, Contractor, Designer</td>
<td>Time overrun</td>
</tr>
<tr>
<td>7</td>
<td>Odeh &amp; Battaineh, (2002)</td>
<td>General construction (Jordan), <strong>Public and private sectors</strong></td>
<td>Client, Resources, Project Manager, Contractual, External, Consultant</td>
<td>Time and cost overrun</td>
</tr>
<tr>
<td>9</td>
<td>Frimpong &amp; Oluwoye, (2003)</td>
<td>Groundwater Construction(Ghana), <strong>Public sector</strong></td>
<td>Finance, Contractor, Resources</td>
<td>Cost overrun</td>
</tr>
<tr>
<td>14</td>
<td>Koushki, (2005)</td>
<td>Residential (Kuwait), <strong>private sector</strong></td>
<td>Client, Finance, Contractor, Resources</td>
<td>Time &amp; cost overrun</td>
</tr>
<tr>
<td>15</td>
<td>Wiguna &amp; Scott, (2005)</td>
<td>Buildings projects (Indonesia), <strong>Private sector</strong></td>
<td>Finance, Client, Designer, External, Contractor</td>
<td>Time &amp; cost overrun</td>
</tr>
<tr>
<td>18</td>
<td>Assaf &amp; Al-Hejji, in (2006)</td>
<td>Construction project(Saudi Arabia), <strong>Public and Private sector</strong></td>
<td>Client</td>
<td>Time overrun</td>
</tr>
<tr>
<td>19</td>
<td>Faridi &amp; El-Sayegh, (2006)</td>
<td>Construction Project (UAE), <strong>Public and Private sector</strong></td>
<td>Consultant, Project manager, Client, Resources</td>
<td>Time overrun</td>
</tr>
<tr>
<td>No</td>
<td>Research</td>
<td>Project</td>
<td>Factors causing delay</td>
<td>Effect of delay</td>
</tr>
<tr>
<td>----</td>
<td>----------</td>
<td>---------</td>
<td>-----------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>20</td>
<td>Fong et al., (2006)</td>
<td>Building construction, fire installation (Hong Kong), Private sector</td>
<td>Project manager, Client, Governmental</td>
<td>Time overrun</td>
</tr>
<tr>
<td>24</td>
<td>Sambasivan and Yau (2007)</td>
<td>Construction projects (Malaysia)</td>
<td>Contractor</td>
<td>Time &amp;cost overrun</td>
</tr>
<tr>
<td>29</td>
<td>Kaliba et. al., (2009)</td>
<td>Road construction (Zambia)</td>
<td>Financial, Designer, Project manager</td>
<td>Cost &amp; time overrun</td>
</tr>
<tr>
<td>30</td>
<td>Motaleb,(2009)</td>
<td>General construction (UAE), Public and Private sectors</td>
<td>Client, Project manager, Finance</td>
<td>Time &amp;cost overrun</td>
</tr>
<tr>
<td>31</td>
<td>Tumi et. al., (2009)</td>
<td>Construction project (Libya), N/A</td>
<td>Project manager</td>
<td>Time &amp;cost overrun</td>
</tr>
<tr>
<td>35</td>
<td>Al-Nuaimi, A., et al.(2010)</td>
<td>Building construction project(Oman), Public and private sectors</td>
<td>Client, Contractual</td>
<td>Time, &amp; cost overrun, Disputes</td>
</tr>
<tr>
<td>37</td>
<td>UN Development, (2010)</td>
<td>Construction projects, schools (Iraq), Public Sector</td>
<td>Governmental, External</td>
<td>Time overrun and dispute</td>
</tr>
</tbody>
</table>
excessive changed orders by the client, add to delays (Sun et al., 2004).

In Ghana, monthly payments, poor contract management, material procurement, poor technical performances, and escalation of building material prices have been identified as the most important factors responsible for time and cost overrun (Frimpong, 2003). Long et al. (2008) reported that incompetent project teams, poor designers and estimations, and management problems related to site and procedural techniques have all been identified as major causes of delay in Vietnam. Koushki et al. (2005) found that the financial difficulties, changing orders, insufficient experience of clients and contractors are the main delay factors in Kuwait. Assaf and Al-Hejji, (2006) identified similar causes in Saudi Arabia. Fong et al. (2006) identified the factors of delay in Hong Kong as being due to project managers (site-coordination) and clients, slow decision making and government inspection, this is in partial agreement with causes of delay in Malaysia (Sambasivan & Yau, 2007). Sweis et al. (2008) concluded that inadequate planning, scheduling and financing by contractors, and changing orders by clients, were found to be the main factors causing delay in Jordan. Therefore, similarities and differences in the causes of delay can be seen, and this paves the way for more advanced research.

**Effects of Delay**

Construction delay has an adverse impact on the project’s ultimate success in terms of time, cost, quality and safety (APM, 2006; Arditi & Pattanakitchamroon, 2006). In addition, the most important effect that should be observed on the success criteria of the project, are the degree of influential variables that are related to the decision-making and variations/change orders made by the client, causing time and cost overrun, as well as other related factors (see Table 1).

Empowerment of stakeholders’ decision making has been encouraged previously in different environments in project management, but it is limited under project management authority. It is more valuable for stakeholders to set their goals and keep inventories, as such managerial functions and effective plans can be born from motivated stakeholders. Moreover, project completion on time and budget within specification (Barber & Warn, 2005) are other measures of success criteria.

**Effect of Knowledge Management**

Significant historical information and knowledge has been used to improve decision-making and the outcomes of project control (Albino et al., 2002).

Variations/change orders by clients increase projects delays, as do those by contractors or other stakeholders, due to a number of reasons, as identified in the literature. Therefore, the construction stakeholders have to think about the nature of these problems, using analytical approaches and case studies. Some efforts have, more recently, stated the importance of a project delay analysis approach, for example, analysis of particular time periods during the project (Theodore et al., 2009). Project managers can benefit from the outcomes of such analysis by more effective multiple baselines and resource allocation in project delay analysis (Menesi, 2007).

In fact, there is a moderating effect on the relation between knowledge management of IT and project success (Yang et al., 2011). Arain (2005) secured the base of knowledge management during the earlier stages of a project life cycle, which means the greatest requirement for effective management of variations/change orders. Therefore, having the right technology can help the project manager to get a better project life-cycle and effective decision-making to consider whether investors are willing to proceed on the business. Furthermore, due to any responding changes the organizations’ methodologies and procedures have to be supported by experts in how to manage the project rather than what has gone wrong (PMBOK, 2004).
Effects of the Financial Crisis

With reference to the construction projects situation in the UAE, and particularly in Dubai, it was published that many stakeholders have been affected by the state of project delays, the contractors and clients, the majority of them being affected by the current financial crisis (Elweshahy, 2008). As a result, clients are not able to deal with the due payments and many projects have been cancelled or postponed (Brendel et al., 2010). The effects of construction delays; however, are not confined to clients, contractors and construction companies, but could influence the overall economy of a country such as the UAE, where the construction industry plays a major role in its national development and contributes 14% to gross domestic product (GDP). This is a common occurrence worldwide, compared with the UK which contributes about 10%, and Singapore, Malaysia, Korea, New Zealand, Australia, and India contributing 3-8% (Low et al., 2009).

In the UAE, both the national and foreign investors persist to encourage people with attractive incentives to invest in their respective properties. This investment trend has generated a bubble in the construction sector, which was then severely affected by the global financial problems of 2008-2009. Moreover, the expansion in construction and infrastructure resulted in an increase in the number of the immigrant workers and expatriate population in a very short time (Abu Dhabi Chamber of Commerce and Industry, 2009).

Faridi and El-Sayegh (2006) revealed that about half of construction projects in the UAE had encountered delays. Motaleb (2009) found that the number of construction projects encountering delays increased by about one fifth in 2009. Despite the time and cost overruns there are still a huge number of construction activities in the country. According to a recent investigation into the current and future state of the construction industry in Dubai, more than half of the construction projects in real estate, infrastructure, leisure and entertainment, worth $582 billion, are now on hold (Global Real Estate News Centre, 2009).

However, there are still construction projects going ahead that are worth about US$700 billion. Therefore, it is crucial to identify the significant causes and effects of delays of construction projects in the UAE since the construction industry represents a dynamic growth-oriented sector. It is also important to critically review the methodology and validation of the measures of control delays and project success factors, according to causes and effects of projects delays. The objective of the research work that underpins this paper is to identify the significant causes and effects of construction project delays in the UAE. This is part of a PhD study aiming to develop a framework for the effective management and control of construction delays in the UAE. In the next section, the research methodology is outlined. Then, results are discussed, before conclusions are drawn and future research work is proposed.

RESEARCH METHODOLOGY

This is an exploratory study and as such a pilot questionnaire survey has been designed with reference to previous research studies in Table1, on various causes of project delays in groups, and limited personal interviews have been conducted. The questionnaire form consists of three sections. The first section is intended to gather information about the respondents’ profile. The second and third sections are enquiring about the causes and effects of construction projects delays, respectively. In this study, the pilot questionnaire is used as a convenient and cost-effective tool to gather information from the target companies, which are geographically scattered in various parts of the UAE. The purpose of the pilot questionnaire was to assess the feasibility of a full-scale survey research. The questionnaire was emailed to two contractors and two consultants, whose feedback was used to modify the questionnaire contents, where appropriate, for the next stage.
Questionnaire Administration

The questionnaire was distributed to a random sample of fifty experts and project managers working in the UAE-based, consulting and contracting, private companies. Thirty five (70%) responded and returned complete and usable questionnaires. The participants were 15 consultants, 12 project managers, and 8 contractors (see Table 3).

Method of Data Analysis

The data analysis was carried out in two parts using SPSS for Windows and Microsoft Excel (version 17). The survey data was manipulated in SPSS to generate the frequency ($f_i$) of the response category index for the cause and effect factors. The relative importance index (RII) for each factor was calculated using the frequency data for each response category generated from SPSS. The RII is the calculation of the mean frequency of each response category index for the probability and impact. It can be calculated as:

$$ RII = \frac{\sum_{i=1}^{n} w_i f_i}{\sum_{i=1}^{n} f_i} \tag{1} $$

Where $f_i$ is the frequency of the $i^{th}$ response, and $w_i$ is the weight assigned to the $i^{th}$ response.

Spearman rank correlation coefficient $r_s$ was also used to determine the strength of the relationship between the consultants and project managers’ ranking for various factors. It is a measure of correlation between two series using the ranks rather than the actual values (Kottegoda, 1997; Coakes et al., 2009). It can be calculated as:

$$ r_s = 1 - \frac{6 \sum_{i=1}^{n} d_i^2}{n^3 - n} \tag{2} $$

Where $d_i$ is the difference in ranking between consultants and project managers $i^{th}$. The higher the value of $r_s$ approaching 1 or -1, the stronger the association between the two sets of ranking (Odeh & Battaineh, 2002).

RESULTS AND DISCUSSION

Causes of Delay

Forty two causes of delay were identified and grouped into 5 sets, namely, i contractors, ii consultants, iii project managers, iv clients, and v financial and other external factors respectively. The top fifteen factors are summarized in Table 4.

Contractors’ Factors

Sixteen contractor-related, frequent causes of delay were identified; two of these causes are among the top fifteen factors included in Table 3. Late delivery of materials was ranked ninth, and inappropriate construction methods was ranked fifteenth. Contractors have to ensure that all resources such as materials are available throughout the project, whenever needed. Accurate time estimations of materials delivery

Table 3. Questionnaire distribution and respondents

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of Distributed</th>
<th>Number of Respondents</th>
<th>Percentage of Respondents%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultants</td>
<td>20</td>
<td>15</td>
<td>75%</td>
</tr>
<tr>
<td>Project managers</td>
<td>17</td>
<td>12</td>
<td>70%</td>
</tr>
<tr>
<td>Contractors</td>
<td>13</td>
<td>8</td>
<td>61%</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>35</td>
<td>70%</td>
</tr>
</tbody>
</table>

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require accurate project information, in terms of quality of information, and information flow, availability and supply of resources.

**Consultants and Project Managers’ Factors**

The consultant and project Manager factors were not included among the list of the top fifteen factors as shown in the Table 3. On the other hand, it is worth noting that the consultants and the project managers put special emphasis on the time and cost estimation, which appeared in the top list to occupy the 11th and 15th rank, respectively. In addition, both the consultants and project managers contribute, to some extent, to other factors including poor site management and supervision, improper project planning and scheduling, incompetent project teams, and inappropriate construction methods.

**Clients’ Factors**

The most important client-related causes of delay are change orders, lack of capability of client representative, slow decision making by the client, and lack of experience of the client in construction. These causes are assuming the 1st to 4th ranks among the top list as shown in Table 3. Excessive change orders can cause significant disruption to project completion, as changes consequently causes changes in schedules, increase costs through rework and decrease labor efficiency. Accurate time and estimations of materials delivery require accurate project information in terms of information quality and flow, availability and supply of resources. Although contractors are perceived to cause some inaccurate estimates, as discussed earlier, they are the ultimate party who produce estimates. It can be argued that the clients are largely responsible as the party that issues excessive change orders. Poor estimation and change management reflect a lack of efficient and effective project management.

**Financial Factors**

Five financial-related causes of delay were identified. Three of these factors, namely inflation and price fluctuations, high interest rates and client financial difficulties are in the list of the
top fifteen as shown in Table 4. These results are expected, given the recent high escalation of prices of steel and cement, the current credit crunch and the related economic crisis in Dubai.

**External Factors**

This group of causes is ranked low by consultants and project managers, and none of these factors are among the top fifteen factors (Table 3). Problems with neighbors are not considered a serious cause of delay as it seems that affected people near sites are usually well informed about projects and satisfactory compensation is offered for their properties. Besides, environmental and social impact assessments are carried out fairly, when necessary, in the UAE. These will ensure that projects run smoothly without interruptions during the construction phases.

**Conformity Between Consultants and Project Managers’ Rankings**

A further analysis has been done to find out the conformity between consultants and project managers, by using the Spearman rank correlation coefficient (Equation 2). This coefficient was found to be 0.918, indicating a strong conformity between consultants and project managers for the ranking of the causes of delays.

**Effects of Delays**

Six potential effects of delay have been identified as shown in Table 5. Time and cost overrun are the two most important effects of delays, ranked first and second respectively, by both consultants and project managers (see Figure 2). These results are in strong agreement with the results of important causes of delay. Out of the top causes of delay (see Figure 1), there are at least five factors that cause the effects of time overrun, including change orders, slow decision making by the client, and lack of capability of the client representative, construction financial difficulties and late delivery of materials. There are at least five factors that can result in cost overrun, including inaccurate cost and time estimations, poor site management, an incompetent project team, and improper project planning and scheduling. These results are also consistent with other published work related to other developing countries, e.g. Aibinu and Jagboro (2002) in Nigeria, and Wiguna and Scott (2005) in Indonesia.

**A Comparative Study**

A similar study has been carried out for the construction industry in the UAE (Faridi & El-Sayegh, 2006). We have summarized, in Table 6, the rank order of the top 15 causes of delay in both the current work and their 2006 study. Ten of the top 15 factors were also reported in the 2006 study. Apart from lack of capability of the client representative, ranked 2nd in both studies, the ranking order of all other common factors changed.

The ‘change orders’ factor has moved considerably, from 27th place to become the most important factor. This is followed by poor
**Table 6. Ranking comparison between 2011 and 2006 of top causes of delay in UAE**

<table>
<thead>
<tr>
<th>Factor Description</th>
<th>2010 Rank</th>
<th>2006 Rank</th>
<th>Rank Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change orders</td>
<td>1</td>
<td>27</td>
<td>-26</td>
</tr>
<tr>
<td>Lack of capability of client representative</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Slow decision making by client</td>
<td>3</td>
<td>---</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Lack of experience of client in construction</td>
<td>4</td>
<td>---</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Poor site management &amp; supervision</td>
<td>5</td>
<td>19</td>
<td>-14</td>
</tr>
<tr>
<td>Incompetent project team</td>
<td>6</td>
<td>12</td>
<td>-6</td>
</tr>
<tr>
<td>Inflation/prices fluctuation</td>
<td>7</td>
<td>---</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Inaccurate time estimating</td>
<td>8</td>
<td>---</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Late delivery of materials</td>
<td>9</td>
<td>6</td>
<td>+3</td>
</tr>
<tr>
<td>Improper project planning / scheduling</td>
<td>10</td>
<td>23</td>
<td>-13</td>
</tr>
<tr>
<td>Inaccurate cost estimating</td>
<td>11</td>
<td>8</td>
<td>+3</td>
</tr>
<tr>
<td>High interest rate</td>
<td>12</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Client’s financial difficulties</td>
<td>13</td>
<td>10</td>
<td>+3</td>
</tr>
<tr>
<td>Unreasonable constraint to client</td>
<td>14</td>
<td>17</td>
<td>-3</td>
</tr>
<tr>
<td>Inappropriate construction methods</td>
<td>15</td>
<td>7</td>
<td>+8</td>
</tr>
</tbody>
</table>
site management & supervision, and improper project planning/scheduling which moved up 14 and 13 places to be the top 5th and 10th, respectively. An incompetent project team moved up six places to be the top 6th factor. Inappropriate construction methods, however, moved down the list 8 places. The remaining 4 factors moved up/down by 3 places.

**Interviews**

In addition, typical interview results have shown that:

1. Two governmental consultants, with more than 30 years experience, explored the importance of proper classifications and categorizations of consultants based on past learning knowledge. However, they have initiated some research ideas to recover managerial defects, but validation is required for UAE construction project performance. They added. Moreover, this will assist public sector projects to evaluate the knowledge, experience, efficiency and past performance of other stakeholders (consultants, contractors and developers etc.).

2. Two consultants, from the private sector, agreed on the significant forecasting budget considering the excessive change orders/ variations by clients, as well as its effect on time and cost. It is argued that the insufficient monthly payments have affected the flexibility of the project progress recently.

3. One project manager criticized the lack of co-related technical financial details. He added, full stakeholder’s knowledge can prevent the unexpected delay and help clients in faster decision making.

4. Another consultant, with 25 years experience, criticized the pre-matured project culture that disturbs any scientific pattern searching of risk control approaches; he said “a very important point is that a positive percentage of prequalified or interested users, who apply the same approach, does not exceed 5%”.

5. Two consultants from the architecture and value chain built environment sections agreed on the project complexity due to pre-bidding analysis, so the critical mission appears in the contract management.

6. Another project manager criticized the recent client attitude towards project slow down completion by getting rid of some of the workforce and this left few posts in the recent financial crisis.

7. All interviewees agreed that proper knowledge tools and financial methods to face a crisis could lead to improvement of project performance, to be noticed that 20% of them did not recognize the difference between financial risk management and procurement.

**CONCLUSIONS AND THE WAY FORWARD**

The objective of the research work that underpins this paper was to investigate the causes and effects of construct project delays in the UAE. Data has been collected through interviews and a pilot questionnaire distributed to a group of experts working in local consulting, project management and contracting companies operating in the UAE.

Forty two potential causes of construction project delays have been identified and categorized into contractor, consultant, project managers, client, financial, and external categories. The significance of these factors has been investigated using the relative importance index method. Fifteen top causes include six client-related factors, four project manager-related factors, three financial factors, and two contractor-related factors. Client-related, project managers and financial factors seem to be the most significant causes of delay. These results are in general agreement with published previous studies in the UAE.

This exploratory study has highlighted a view of the many distress projects in the UAE and particularly in Dubai, in the financial crisis, the trade press have recently detailed how the UAE has been severely affected by the global
economic downturn with reports of many project delays, and this may add the factor of the risk of financial crisis to the list of factors, although it has not yet been fully investigated.

The effects of construction delay have also been investigated. Time and cost overrun have been found to be the two most important effects. This is in strong agreement with the identified significant causes of delay. So, it is only a matter of time before the stakeholders begin to avail themselves of the phenomenon described above. However, some of the results are surprising and have implications regarding additional measures of project success, the need for knowledge management training for clients, and their representatives, but also project managers and their teams in risk management innovation.

Further future work could include conducting a well-grounded survey of construction delays analysis in the UAE to triangulate the initial approach adopted in these research findings and provide direction for IT project managers to adopt advanced techniques for project delay control. In addition, the effects of information flow between the organization levels, the importance of professional project management programmes and skills development. Accuracy of procedures and record keeping will also become indispensable, by the next decade, for IT project managers.

Figure 3. Determinant of control construction project delay in terms of specific Hypotheses (H). There is a positive relationship between: perceived knowledge of risk in the earlier stage of construction and time (H1), perceived knowledge of risk in the earlier stage of construction and cost control (H2), appropriate client’s knowledge in variations and time control at early stage (H3), there is a negative relationship between: slack of performance and time control (H4), slack of performance and cost control (H5), slack of performance and quality control (H6). There is a positive relationship between: stakeholders’ decision-making (Client, contractor, developers, and governmental processor) and time control (H7). There is a negative relationship between: lack of forecasting budget knowledge and time control (H8), lack of forecasting budget knowledge and cost control (H9). There is a positive relationship between: the time control and project success criteria (H10), the time control and project success criteria (H11), the time control and project success criteria (H12), the satisfied project success criteria and time future use (H13), the future use of the success criteria and control delay (H14)
The problem of project control can be summarized as controlling additional measures to prevent delay, such as developing stakeholder knowledge management, as this may formulate good dependencies of relationship and interaction, rather than depending on the traditional success criteria; and predicting changes in the early stages can minimize the disruptive/risk effects. Moreover, to save time and help the project team in decision making, developing the project performance and confirming stakeholders’ expectations.

In a way of validating variables/measures in a proposed conceptual framework to control the delays, hypotheses are set in Figure 3 to resolve the great percentage of a problem related to poor knowledge of stakeholders in the preconstruction stage. Noticeably, the majority of the interviewees insisted on significant and proper knowledge management to control the risk of delay, rather than depending on local management tools only.

Limitations of the study are the sample size and the methodology adopted. Therefore, due to the small number of responses, further, more extensive studies are required to support the above findings.

REFERENCES


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