

Critical Evaluation of the Previous Delay Studies in Construction

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Abstract:

Over many years, delay has emerged one of the most significant problems in the construction industry, so much so that the causes have been investigated in numerous studies in different developing countries. Poor project management has been cited by a number of investigators as one of the main reasons. However, despite such consensus, there are usually no clear recommendations demonstrating how project management practice could be improved. Moreover, the majority of recommendations made in the existing studies are general in nature and do not lead to a focus on a specific area. None of them are devoted to solving the difficulties associated with particular causes. The paper argues that the utility of further traditional studies on delay is limited. Accordingly, this paper argues that rather than solely explanatory research, constructive and action research need to be implemented to the construction industry More Efficiently.

Key words:

Action Research, Construction Industry, Constructive Research, Delay, Project Management.

1. Introduction

A traditional contract document normally identifies the commencement date and completion date for the project. If, however, problems occur during the construction, the project duration is extended beyond the agreed scheduled completion date, and delay arises (Lewis and Atherely, 1996). Delay can be defined as the difference in time between the date of project completion stated in the contract and the date of actual completion. Assaf and Al-Hejji (2006) define delay as the time over-run either beyond the contract date or beyond the date that the parties agreed upon for the delivery of a project.

Over many years, delay has emerged one of the most significant problems in the construction industry, so much so that the causes have been investigated in numerous studies in different developing countries. The contents of the paper are as follows. Firstly, the studies concerning the causes of construction delay in developing countries are explored in order to examine what causes have been identified and what solutions have been proposed. Then and acting from the sense that these are controllable factors, attention is given specifically to delay causes related to project management (i.e. poor site

management, and ineffective planning and controlling). Secondly, having highlighted the problem, this paper argues that the starting point for an improvement could be achieved by implementing practical management techniques which help the project managers and site teams to improve their management practices. In this context, the paper argues that rather than solely explanatory research, constructive and action research need to be implemented to the construction industry more efficiently aiming to explore the industry problems and then working to overcome such problems which will have significant impact on improving the practice and tackle some of the managerial problems. Finally, the paper argues that the utility of further traditional studies on delay is limited.

2. Causes of Delay

Studies on construction delay in different developing countries (table 1) have revealed several causes, the most frequent, together with their occurrence, being presented in Table 2. Ineffective planning and controlling is a common feature identified in most studies (87%), with disparities only in the degree of importance from one study to another. Most of the reported investigations have concluded that poor site management (56%) and problems of supply chain and procurement (69%) are considered as other main causes for delay. Delay in materials delivery, damage to materials when they are needed urgently and late procurement of materials, which are all related to poor project management, also worsen the problem. Taken together, these findings indicate that either the fault lies with those responsible for planning and management, or with the planning and management techniques themselves.

Another cluster of problems leading to delays covers labour shortage, problems in material supply and financial difficulties, all related to the immaturity of the economy, financial institutions and labour market in a developing country. These are external factors that have to be taken as given in a project.

Table 1: Previous studies on delay

<i>Study</i>	<i>Number</i>
<i>Assaf and Al-Hajjij, 2006</i>	<i>1</i>
<i>Assaf et al. ,1995</i>	<i>2</i>
<i>Faridi and El-Sayegh, 2006</i>	<i>3</i>
<i>Koushki et al., 2005</i>	<i>4</i>
<i>Odeh and Battinah, 2002</i>	<i>5</i>
<i>Sweis et al., 2007</i>	<i>6</i>
<i>Abdul-Rahman et al.,2006</i>	<i>7</i>
<i>Alghbari et al.,2007</i>	<i>8</i>
<i>Mezher and Tawil, 1998</i>	<i>9</i>
<i>Lo et al., 2006</i>	<i>10</i>
<i>Fimpong and Oluwoye, 2003</i>	<i>11</i>
<i>Mansfeild et al.,1994</i>	<i>12</i>
<i>Kaming et al., 1997</i>	<i>13</i>
<i>Ogunlana and Promkuntong, 1996</i>	<i>14</i>
<i>Arditi et al. 1985</i>	<i>15</i>
<i>Long et al., 2004</i>	<i>16</i>

Table 2: Summary of Previous Studies of Delay Causes (Note. number between brackets refer to previous delay studies, see table 1)

Delay Causes	KSA (1,2)	UAE (3)	Kuwait (4)	Jordan (5,6)	Malaysia (7,8)	Lebanon (9)	Hong Kong (10)	Ghana (11)	Nigeria (12)	Indonesia (13)	Thailand (14)	Turkey (15)	Vietnam (16)	No. of Occurrence
Poor planning and controlling	**	*	*	**	*	*		*	*	*	*	*	*	14
Poor site management	*	*		*	**	*	*	*					*	9
Labour shortage and productivity		*		**	**		*		*	*				8
Material Supply chain and procurement	*		*	**	**		*	*	*		*	*		11
Financial difficulties	**			**	**				*		*	*		9
Change in design	*			**	*	*	*				*	*		8
Sub-contractor-related problems	*				*	*	*							4
Poor communication and coordination				*	**		*	*			*			6
Weather	*			*	**		*		*		*			7
Others	**	*		*	*		*	*	*		*			9

3. Critical Evaluation of the Delay Studies

Different recommendations have resulted from these studies (Table 3). Recommendations where made are: only 31% of studies mention improving planning and controlling, and only four studies out of sixteen (25%) recommend improving site management. Improving human resource management has been recommended by 37.5% of the examined studies. Other recommendations such as improving communication and collaboration between the parties involved, improving financial support, and minimising design changes were made by 37.5%, 37.5% and 19% of studies respectively. In the following, previous delay studies are criticised regarding three aspects. First, not all studies made recommendations. Second, as ineffective planning and controlling was to be found common factor on the majority of the studies, it is expected that recommendations produced to overcome its impact but unfortunately this did not happen. Thirdly, even few studies have recommend improvements; they have not proposed the necessary tools to facilitate such improvements.

3.1 Recommendations not made

From table 3, it can be shown that not all studies made recommendations; 25% of the studies did not recommend solutions to the problematic causes of delay. Different reasons for this may be given, such as that the aims of the respective research was limited to finding or causes or the funding of the research problem was limited. However, it can hardly be argued that a delay study would have other motivations than to facilitate the removal of those delays, and from this angle, the failure to discuss solutions to delay problems is disappointing.

3.2 Recommendations do not match findings

In the majority of the studies, it can be noticed that recommendations derived do not match the findings. Figure 1 shows the frequency of delay causes and corresponding recommendations in delay studies. Returning to Table 1, let's consider one particular factor, ineffective planning and controlling, as an example. It is interesting to note that fourteen cases out of sixteen (87%) mention this, thereby indicating that this factor should be focused on and recommendations produced to overcome its impact. Another example, the problem with supply chain and procurement, was found to be mentioned in 69% of studies, giving the impression that this is a particularly problematic area. The third example, poor site management, was cited in 56% of studies, featuring as the third main cause of delay, yet few studies proposed solutions to improve site management.

3.3 Recommendations do not contain practical advice

Although a few studies have recommended improvements, they have not proposed the tools to facilitate such improvements, and how the recommendations could be implemented. The following are some examples.

Over a decade ago in Nigeria, Ogunulana et al. (1996) proposed that owner associations, designers, contractors, suppliers, finance houses, educational institutions, manufacturers and the government should co-operate to provide the infrastructure necessary for efficient project management. However, the research fell short of determining the nature of such infrastructure, and the question therefore, remains, as to what constitutes this, and how to adopt it within the construction industry. Two years later in Lebanon, Mezher and Tawil (1998) stated that the construction industry must adopt innovative management techniques, team building and value engineering, in order to become more efficient and effective. However, the researchers did not specify their understanding of innovative management techniques, nor did they offer examples of techniques that could be used to improve team building.

In a similar vein, in Jordan, Al-Momani (2000) argued that the findings presented in his study provide good guidance for managerial intervention, but did not specify what kind of intervention, in what area of project management, and how this intervention could be put in practice on a construction site.

More recently, in Saudi Arabia, Assaf and Al-Hejji (2006) recommended contractors to consider planning and scheduling as continuing processes during construction, and to match these with the resources and time to develop the work to avoid delay, cost over-run and disputes. This necessitates some clarification as to how this could be carried out and what kind of planning tools might assist in achieving this recommendation.

And in the same year, in Hong Kong, Lo et al. (2006) recommended that comprehensive strategies need to be formulated to minimise variations, whether client-initiated or consultant-initiated, wherever possible. A clear and thorough client brief is considered the most useful strategy for reducing variations. Contingency allowances may be incorporated for inevitable variations. The question that arises here is what kind of methods could help minimising variations?

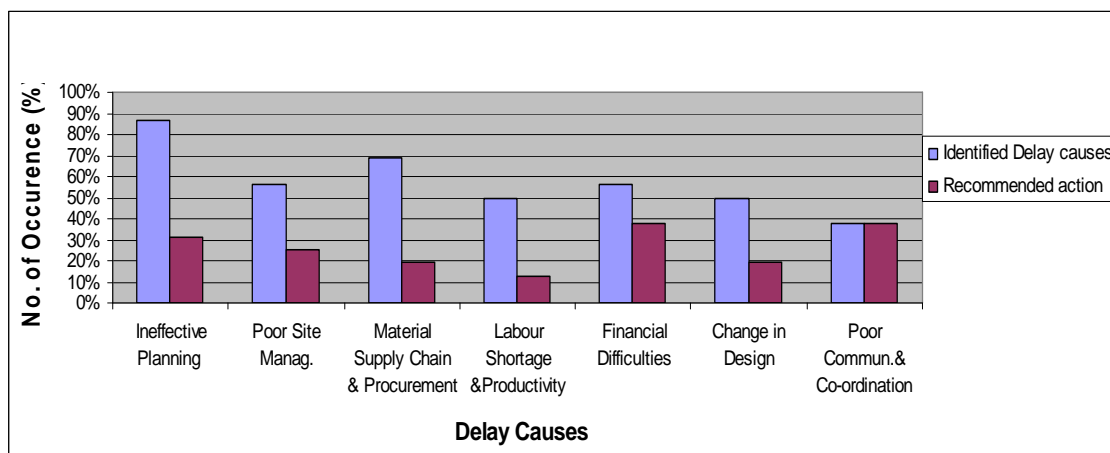


Fig.1. Frequency of Delay Causes and Corresponding Recommendations in Delay Studies

Table 3: Summary of Recommendations from Previous Delay Studies (number between brackets refer to delay studies see table 1)

Recommendations	SA (1)	SA (2)	UAE (3)	Kuwait (4)	Jordan (5)	Jordan (6)	Malaysia (7,8)	Lebanon (9)	Hong Kong (10)	Ghana (11)	Nigeria (12)	Indonesia (13)	Thailand (14)	Turkey (15)	Vietnam (16)	No. of Occurrence			
Improve planning and controlling	*	No recommendations	*	*		No recommendations	*		*	No recommendations						5			
Improve site management and supervision	*							*							*			4	
Minimise design change	*				*				*										3
Improve financial support	*				*				**			*		*					6
Improve materials supply, procurement														*	*		*		3
Improve productivity									*						*				2
Improve human resource management				*			*		*		*	*				*			6
Improve communication and co-ordination									**		*	*		*		*			6
Adopt new management techniques											*						*		2
Adopt new approach to contract award							*												1
Others	*		*	*	*		*					*				6			

4. Discussion

To sum up, from the recommendations (Table 3), it can be clearly stated that the majority of suggestions do not contribute to problem-solving. For instance, they are neither specific to a particular problem, nor to particular causes. It can be clearly concluded that the majority of these studies did not recommend practical solutions or methods to improve the situation. Moreover, they did not explore the reasons for the causes. For example, a common delay factor is ineffective planning and controlling, yet none of the researched examined the reasons behind this cause, which could be just one, or several, since planning may be ineffective because of inadequate planning tools and techniques and/or because of incompetent/untrained people with responsibility for formulating and facilitating the plans.

Given that problems with management in general, and planning and controlling specifically, were identified, it is to be expected that recommendations in these areas would be made, but unfortunately, the majority of studies do not provide any. Taken together, the findings from all these studies are that the problems in construction projects are either management problems or related to environment of the project. Consequently, these management problems in particular, should be understood and efforts directed towards developing solutions and more efficient methods of operation.

Findings from delay studies suggest several courses of action for planning practice in construction. In this context, the paper recommends that rather than solely explanatory research, constructive and action research (Jarvinen, 2007) need to be implemented to the construction industry more efficiently for the following purposes:

- To explore the industry problems such as delay causes, low productivity and others and then working to overcome such problems.
- Such research methods may help in improving the practice and tackle some of the managerial problems.
- Contribution could be made to improve the practical concerns of people in practice and the theory of construction project management.

Since 1993, Lean Construction has been introduced as a new knowledge and different way to manage construction more efficiently and effectively. Different Lean Construction techniques have been implemented by many construction firms around the world aiming to improve the performance, eliminate waste and maximize value where major benefits have been achieved. Benefits have been gained from these techniques are known to include: efficient planning and control, minimising waste, improving productivity, promotion of team building, improved communication and collaboration and promote learning process. The best known of the Lean construction techniques is Last Planner (Ballard and Howell, 1998). Last Planner has been demonstrated to be a very useful tool for the management of the construction process, and continuous monitoring of the

planning efficiency. Last Planner is a way of buffering task execution by only allowing those quality assignments that are completely ready to be started in the context of effective lookahead planning, and close monitoring of the per cent plan complete (Winch, 2006). The Last Planner System has been broadly and successfully implemented in several countries (Ballard and Howell, 2003).

Of course, the implementation of the Last Planner method in different developing countries (Junior et al., 1998, Fiallo and Revelo, 2002, Thomassen et al.2003, Lim et al, 2006) can be pinpointed as examples of such constructive and action research. For more information about Lean construction and Last Planner see (www.iglc.net).

5. Conclusion

In this paper, a simple quantitative analysis of the findings and recommendations in different studies of delay has been carried out. The result of this analysis shows that the findings on causes cluster around two issues, management and project environment, and that recommendations only in a rather limited way contribute to problem solving. Thus, it can be argued that the utility of conducting more traditional studies on delay is limited, as their contribution to knowledge and practice is modest at best. In this context, this paper recommends that rather than solely explanatory, also constructive and action research should be used on construction project management to enhance the performance of the practice and tackle some of the persistent managerial difficulties. Consequently, Lean Construction techniques are recommended since major benefits have been gained from these techniques and are known to include: efficient planning and control, increasing productivity, the promotion of team building, improved communication and collaboration. The best known from these techniques; Last Planner, has become an efficient management technique since substantial advantages have been achieved from its implementation around the world.

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