



The Impact of Poor Planning and Management on the Duration of Construction Projects: A Review

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Abstract

The construction business is a noteworthy player in the economic sectors, creating both, wealth and employment. However numerous ventures encounter broad delays and time overruns leading to as surpass in starting time and cost estimations. Despite the fact that project management has demonstrated its accomplishment in construction as a procurement strategy, there are issues related with the way in which the projects have been planned or managed that have prompted venture postponements, cost overruns and delays with low client fulfillment. The aim of this paper is to review the impact of poor planning and management on the duration of construction projects. This research is based on a descriptive methodology, in which the researcher tends to review previous studies and literature that will help in identifying the relationship between the poor planning and management of project and the occurrence of delays in the construction projects. Literatures analysis discloses that poor project planning and management is cited by several researchers as a delay factor in the construction projects. The researcher concludes that poor planning and management of the construction projects may lead to several negative effects on the duration and completion of projects. Construction delays and duration issues are frequently responsible of transforming productive ventures into losing projects. These delays can be reduced or prevented by an increased pre- project planning and successful



project management as they are one of the most critical success factors of the construction project accomplishment.

1. Introduction:

The construction sector consists of a range of activities related to buildings and engineering constructions of all types, as well as maintenance, planning and management. This sector is closely related to various other economic sectors, making it an important and reliable indicator of the movement and trends of the national economy (Sweis, Sweis, Hammad, & Shboul, 2008). However, there are many risks that are encountering construction projects and threatening its operations. These risks are caused mainly by poor planning and management that affect the progress of the project and result in delayed delivery or increased cost, and sometimes poor construction quality (Gajewska, & Ropel, 2011).

A construction project is normally recognized to be successful when it is finished within its budget, on its planning time and according to its standards and specifications Olawale and Sun (2012); (Frimpong, et al. (2003); Majid (2006). In the development and construction business, contractual workers and engineers have a tendency to limit the duration of their ventures and amplify their profit to increase their construction market share and to provide this sector with successful progression and development. To accomplish this tendency, it is vital for project managers to deliberately recognize the schedules and plans of a project and measure their effects before the implementation stage (Gunduz, Nielsen, & Ozdemir, 2013).

Construction projects are of a special nature and characterized by their long period of time, which may lead to variations in conditions and possibilities. The long duration of the projects and their multi-stage processes starting from the preparing and beginning of the project to implementation and final delivery of it; lead to several conditions, possibilities, uncertainties and the possibility of falling into the risk of



extending the duration of the project or incurred financial or other losses, which adversely affect the operation of the project and the economics of construction (Gajewska, & Ropel, 2011). In spite of the similarity of construction projects in terms of nature and purpose, the variation in their operating place or any other variable can change the preparation process of project and the way to manage it. So, this requires a good management and planning of the project in a way that avoids falling into constructing and planning risks and guarantees success and achievement of its objectives (Falqi, 2004).

Those projects may vary in duration, size, environment, complexity, objectives, conditions, organization structures, deadlines, financial intensity, uncertainty, and other different dimensions Keung and Shen (2012); Zou et al. (2007). However, in a construction project where time really worth money, time planning and management is vital (Duran, 2006). The delay in construction projects, which means the non-completion and achievement of the project inside the predefined construction contract's duration, is considered to be a standout amongst the most repeating issues in the construction business (Mahamid et al. 2012). As indicated by Duran (2006), the industry and business of construction has an awful notoriety for familiarizing with delays and postpones. Postpone examination is either disregarded or done subjectively by only including a contingency. Therefore, numerous construction projects fail to meet the planning timetable's due dates (Duran, 2006). One of the interested examples among many other countless examples is Indonesia, in which Trigunarsyah (2004) recognized that 47% of the construction ventures were finished within its timetable, only 15% of construction project were in front of the timetable, and 38% were behind it which is a large percentage that requires to be taken into account.

Indonesia is not the only country facing this delay and the postponement of the construction project. On the contrary, most of the world's countries , specifically developing countries face this specified problem in their construction sectors and it becomes a common issue for the construction industry, which are primarily caused by



poor pre-construction planning and mismanagement of the project at its various stages (Duran, 2006). Therefore, this research paper represents an investigation attempt to shed light on and review some of the prominent researches and literature that studied the relationship between poor management and planning of the project and the delays that result from it, as the construction delays has become a common bad phenomenon associated with this sector.

1.1 Problem Statement and Study objectives:

Delays in construction ventures are common in the developing countries as well as developed countries' industry (Falqi, 2004). Construction delays and duration issues are frequently responsible of transforming productive ventures into losing projects. These delays can be reduced or prevented by an increased pre- project planning and successful project management as they are one of the most critical success factors of the construction project accomplishment (Yang et al., 2012). Construction projects' managers ought to deliberately evaluate the likelihood of postponements and delays to secure project achievement. Foreseeing and predicting the likelihood of postponements and project preplanning play a crucial role towards the success and achievement of project within its planned timeframe and budget (Kim et al., 2009). Hence, this paper tends to explore and review **"the impact of poor planning and management on the duration of construction projects"**, which is achieved through the following subdivided objectives:

- 1) To identify project planning and management process definitions.
- 2) To clarify construction projects situation in developing countries.
- 3) To identify delays, its types and responsibilities.
- 4) To review the relation between the project planning and management and the duration of the projects.

1.2 Methodology

Research methodology can be defined as a subject that deals with how research or study is carried out in a scientific way. The importance of research methodologies lies



in its ability to highlight and give essential training in the arrangement and collection of material in a way that can be recognized in an easy way (Saunders, 2011). This research is based on a descriptive methodology, in which the researcher tends to review previous studies and literature that will help in identifying the relationship between the poor planning and management of project and the occurrence of delays in the construction projects. Primary data will be collected from the literature, related studies, cases and investigations which will help in identifying the impact of poor planning and management on the duration of construction projects.

2. Literature Review:

Project Management Institute defines a project as a temporary activity that is initiated to create a unique product, service or outcome that has a specific beginning and end, and is reached when the project objectives are achieved or when the project is terminated because its objectives cannot be achieved or when the need arises for this project no longer exists. The term "temporary" does not necessarily mean shortening the time period, nor does it generally apply to the service or product produced by the project, since most projects have a result that is expected to continue and last, for example: the project which includes the construction of a monument, will produce a result that is expected to last for centuries. Also, the projects may have social, economic or environmental impacts that are greater than the projects themselves in continuity (Snyder, 2014).

The construction project, as defined by Gould and Joyce (2009), is an idea that is defined by the owner and then developed by the designers and then produced by the contractor, where the contractor returns it to the owner after implementation have accomplished as required. This project requires many processes in order to be successful such as, managing, planning, controlling, monitoring and many other processes. The project management and planning process is an important process and



the negligence of it leads to many problems in the construction project, including economic or time duration problems (Lester, 2006).

A literature investigation uncovers that poor venture planning and management is cited by numerous researchers as a delay factor in the construction ventures (Hoseini, 2015). Project planning and management have a wide range of aspects and this review just addresses time aspect of this process; hence it would be important to clarify the project planning and management process precisely.

– Concept of Project Planning and Management

Project is characterized as succession of tasks and activities that have certain targets with specific standards, recognized beginning and complete dates, budgetary constraints, requires nonhuman and human assets and include different functions (Kerzner, 2009). The essential challenge of venture management and administration is to accomplish venture targets considering its constraints and limitations (Zidane, 2012). This requires applying skills, techniques, tools, knowledge to project tasks in order to achieve project prerequisites (PMI, 2013, Westland, 2007). As indicated by (PMI, 2013), project management includes:

- 1) Identifying of the Project requirements.
- 2) Addressing project stakeholder desires.
- 3) Correspondence administration between the partners.
- 4) Adjusting venture imperatives.

Project management must combine the following three components in order to achieve those previous mentioned requirements (Westland, 2007):

- 1) Skills: experience and skills in order to minimize the risks within the venture and in the same manner increase the probability of its success.
- 2) Processes: several techniques and process including ; cost management, time management , risk management , quality management and other



processes that are required in order to control and monitor cost , time ,scope and quality of projects.

- 3) Tools: such as; financial software, planning software, review and audit forms that are used by managers in order to increase project success probability.

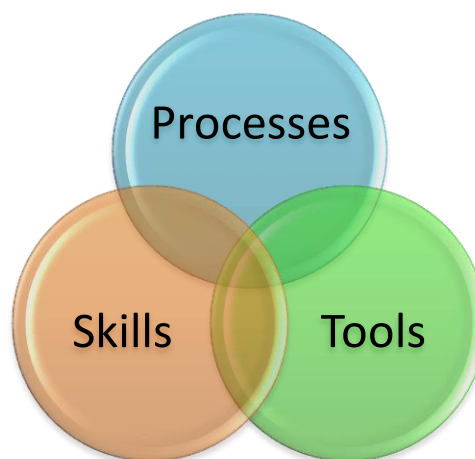


Figure (1): Project management components (Westland, 2007)

According to (PMI, 2013), "project time management is the processes required to manage timely completion of the project". Indeed, time management is a process that records and controls time spent to finish each activity (PMI, 2013).

It is impossible to satisfy the venture management necessities and apply its parts without planning for the project (Zwikael et al., 2014). Indeed, project planning is a proposition of how to do all the venture administration activities and tasks to accomplish the project objectives. The essential function of time project management is to serve the venture manager as a guide to demonstrate the path from venture begins date to its complete date (Mantel, 2001). Without having the guide, venture



manager cannot achieve the project tasks which result in failure in achieving objectives of venture (Mantel, 2001).

Several investigators identify list of the things and steps that must be followed in order to have a good plan for the project. However, PMI introduces project planning process as following steps: create project management plan, Gather requirements, Describe scope, Make Work Breakdown Structure (WBS), Express activities, order activities, Evaluate activity resources, Evaluate activity duration, create schedule, evaluate costs, Decide budget, Plan quality, create human resources plan, communication plan, Risk management Plan, clarify risks, Perform quantitative and qualitative risk analysis, Plan risk Responses and finally Plan procurement (PMI, 2013).

Project planning activities continue for the whole duration of the construction phases. Those planning periods are described as in the following (Hoseini, 2015):

- 1) Initiation planning: The initiation planning process frequently incorporates initial scope description and budget preparation from the proprietor association's point of view (Lines et al., 2015)
- 2) Preconstruction planning: After the project budgetary and scope clarification, the project move into the detailed planning phase. This preconstruction period may include the design phase, the planning phase, and the award phase (Lines et al., 2015).
- 3) Construction execution planning: planning may happen amid the execution stage, which comprises of all exercises past activation and completion of preconstruction planning (Lines et al., 2015).

Project schedule is the output of venture time management and planning process (PMI, 2013, Lines et al., 2015). This schedule enables the venture administrator to control the measure of time spent by every action inside the project (Westland, 2007). As specified previously, venture planning is a wide-ranging term



and comprises diverse perspectives. The Following figure demonstrates venture planning is limited to project time management and the result of it is project schedule.

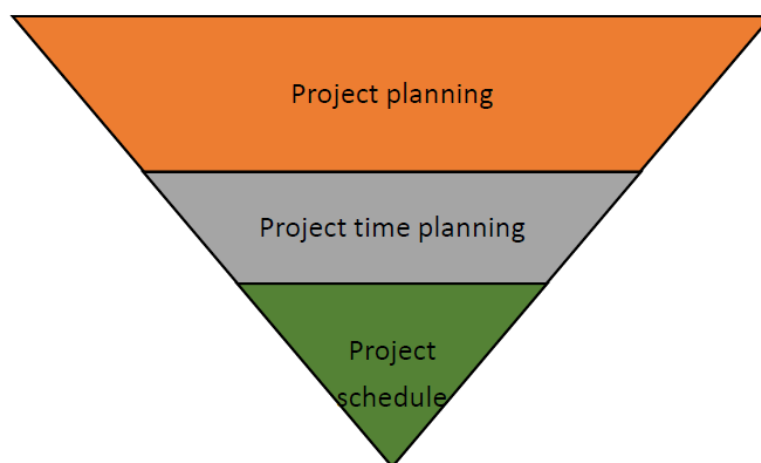


Figure (2): project planning and management concept (Lines et al., 2015)

– Construction Projects Situation in Developing Countries

Long et al (2004) state that performance of construction projects in developing countries is influenced by many factors that results in project delays, poor quality, safety issues and cost over runs. Problems in construction projects are evident across the globe. However, there is a need to focus on factors based on geographical, regional and country. Various factors that influence project performance are same in different countries, but few are different in developing countries including incompetent contractors or designers, poor quality of change management, social constraints, challenges due to technological advancements, site specific issues, lack of advanced tools and techniques, poor planning and estimation of project. All such factors influence the performance of construction projects in developing countries and results in delays. Frimpong, Oluwoye and Crawford (2003) state that cost over runs and delays are very common in building projects. Developing countries have no exception rather they have to face even greater number of problems causing delays and cost overrun than developed countries. Different factors cause delays in



construction such as poor construction management skills of contractors, lack of technical performance, increased material prices, and procurement of material and disbursement difficulties from agencies. All these factors need to be identified properly in projects and then proper planning and management is required to cope with the challenges. Developing countries can overcome these problems by improving their project planning, improving monitoring measures, establishing controls and proper knowledge about the construction project management techniques and their implementation. If managed properly, cost and delay problems can be controlled.

According to Enshassi, Mohamed and Abushaban (2009), construction projects have to face many complex issues and problems due to the impact of certain factors. The most important factors influencing the performance of construction projects in developing countries are lack of resources required for construction, hindrances at borders or due to roads closures thus resulting in material shortage, lack of leadership skills, appreciation of material prices, lack of qualified and experienced personnel and poor quality of construction material and equipment. All these factors influence the performance of project resulting in delays, claims and disputes.

Construction project managers can control delays and cost overruns by focusing on these factors. Sambasivan and Soon (2007) stated that delay of construction projects is a global phenomenon and the construction inductor in developing countries is no exception. Delays in construction projects are caused by improper planning of contractors, inadequate experience, poor site management, inadequate finance, delayed payments, conflicts with subcontractors, lack of material, lack of equipment, and communication gap between parties and errors in construction methods. Such factors results in disputes, cost overrun, delays, litigation, arbitration and total abandonment.

– Delays, Its Types and Responsibilities

Delay in construction projects is defined as the time difference between the date of termination of the project listed or specified in the contract and the actual date



of completion of the project (Falqi, 2004), or the time difference between the planned time and the actual time of project activities (González et al., 2008). The delay in the construction projects is also defined as the time beyond the completion date specified in the contract or beyond the date agreed upon by the parties to hand over the project whether or not the owner is allowed to extend the time or is subjected to a fine or penalty or not (Al-Ghafly, 1995), and the delay was defined as something unexpected and non-existent Planned occurred that cause a delay in the project schedule (Trauner, 2009). In another definition of Stumpf (2000), the delay is an act or event that results in an extension of the time required to perform a specific task required by contract or contract frame, where the delay appears in the form of additional days or late onset of subsequent activity, which may or may not include changes in the scope of the contract.

Several studies and researchers like (Alaghabri et al., 2007); (Vidalis and Najafi, 2002) have classified the delays faced by construction projects into several major types, which are: Concurrent delay, Critical delay, Compensable delay, and Excusable delay. Figure 3 represents the sequential relationships between those different groups of delays (Vidalis and Najafi, 2002).

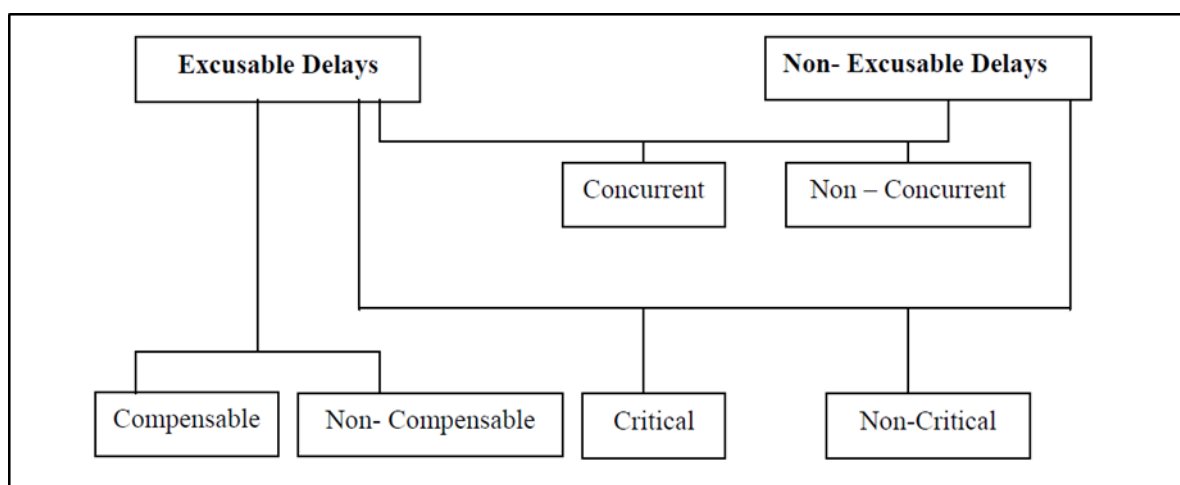




Figure (3): the sequential relationships between different groups of delays (Vidalis and Najafi, 2002).

The project process is affected internally or externally by those previous types of delays. The external causes of delay are due to outside construction project's factors such as utilities, subcontractors, governments, labor unions, suppliers, nature, etc. however, the internal causes of delays are resulted from the contractors , designers , owner and consultants (Vidalis and Najafi, 2002) .

The responsibilities of delay categorized by (Vidalis and Najafi, 2002) as following:

- Neither party responsible: The cause of this delay is neither of the project's parties, and occurs for reasons beyond the control of the parties to the contract, or the so-called "acts of God". In this case, the contractor obtains an extension of the period of execution as the owner deems appropriate and does not receive compensation for the collateral damages. Also he shall not be liable to pay fines or penal conditions.
- Owner responsible: this delay caused by the owner or one of his agents and representatives, and here the contractor is entitled to claim compensation for material damage suffered as well as the extension of the implementation time.
- Contractor or subcontractor responsible: it is considered as a breach of the contract by the Contractor. In this case, the Contractor shall not be entitled to extend the period of implementation of the Project nor to receive compensation. Also, the Owner shall also be entitled to impose delay penalties on the contractor and deduct it from his dues.
- Both parties are responsible: in this case the contractor gets additional time to complete the work, but does not receive compensation and does not pay any penalty or fines.

Furthermore, (Doloi et al., 2012) examined the critical key factors that cause the delays in construction project, where they mentioned that the most critical ones are :



1. Absence of commitment .
2. Inadequate site management.
3. Weak and inadequate site management.
4. Unsuitable planning.
5. Absence of clearness in project scope.
6. Lack of communication.

And all of those previous causes are related to the improper and inappropriate management and planning for the project, which its relation and impact will be identified clearly in the following.

– The Impact of Poor Planning and Management on the Duration of Construction Projects

Several researchers and investigators identified causes of construction delays based on the country in which they develop their study. One of the most common delay factors that were mentioned by several researchers was "poor project planning and management". This factor was cited by several authors indicated in the following table (Hoseini, 2015):

Table (1): poor project management and planning as common delay factor in literature

Common delay and time overrun factor	Researcher
Poor project management and planning	(Khoshgoftar et al., 2010), (Al-Kharashi and Skitmore, 2009), (Faridi and El-Sayegh, 2006), (Assaf and Al-Hejji, 2006), (Sweis et al., 2008), (Pourrostam and Ismail, 2011), (Akogbe et al., 2013), (Marzouk and El-Rasas, 2014), (Muya et



	al., 2013) , (Toor and Ogunlana, 2008), (Sambasivan and Soon, 2007)
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Considering those previous mentioned researches , poor planning and management was mentioned in their works as general term of delay and time overrun , including : resource planning ,time planning, financial planning, equipment and site management , etc. (Hoseini, 2015).

The advantages of pre-project planning incorporate expanded benefit, higher quality and decreased hazard (González et al. 2008). The efforts used up in this early venture stage influence the level of progress amid start-up and in the detailed outline and development stages (Yang and Wei 2010). This finding is upheld by Thomas and Ellis (2007), who utilized straightforward pre-project planning and management techniques to diminish introductory construction duration by 30%. Hanna and Skiffington (2010) contended that expanded construction management and arranging enables the contractual worker to be more proactive than responsive with respect to basic factors that influence a venture. As per Gibson et al. (2006), the beneficial outcomes of reasonable planning for expense and time before configuration, and also amid the construction stage, are enhanced project result, more noteworthy client fulfillment, and decreased venture duration and cost. Consequently, distinguishing and testing for huge contrasts in the effects of the vital success factors on cost, quality, and time are essential in managing these elements in pre-project arranging as an approach to secure the best outcome of the venture.

As indicated by Dvir et al. (2003), there is a solid relationship between fruitful project planning and management and the achievement of a venture from the point of view of venture partners. These researchers likewise demonstrated that reasonable definitions of useful and specialized details in venture planning can prompt more viable execution of tasks. They additionally found a solid relationship between effective usage of planning systems and advantages to construction project partners.



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Such discoveries are affirmed in a later report which demonstrated that venture success can be estimated in perspective of the quality of the project planning and management; though poor management and planning implies uncontrolled changes in the arranging factors of quality, time and cost (Dvir and Lechler, 2004). Zwikael (2009) contended that numerous construction ventures will probably be liable to the danger of poor project arranging when contrasted with ventures in non-construction areas. Zwikael evaluated the significance and impact of project planning in construction projects and found that the degree of utilization of proper venture planning by venture managers and other project partners was not at the ideal level of project prerequisites. He promote contended that a solid attention ought to be set on characterizing the venture scope, venture exercises and expenses. With respect to planning, the improvement of a good venture schedule is imperative to a comprehension of project execution and control. Good scheduling demonstrates a guide and map for venture chiefs, schedulers and planners in observing and following basic milestones and activities amid the progress of venture (Baldwin and Bordoli, 2014).

3. Conclusion:

The reason for construction project planning and management is to organize, plan, coordinate, monitor and control the utilization of project goals in the best way as indicated by project partners' needs. It includes numerous processes and sub-processes and incorporates the identifying of venture scope, duties and responsibilities of the project workers, cost evaluating, venture stakeholder management, and additionally the use of arranging and control strategies and instruments. These require learning of



the essentials of project management keeping in mind the end goal to create fruitful project schedules and plans, which are vital for the conveyance of the venture to time, quality and cost destinations. Where there is an absence of knowledge, the application of venture planning and management ideas will bring about fragmented and incomplete venture plans or poor planning and, henceforth, loss of project's execution efficiency and performance.

Due to this review of several researches and literature, the researcher can conclude that poor planning and management of the construction projects may lead to several negative effects on the duration and completion of projects. Construction delays and duration issues are frequently responsible of transforming productive ventures into losing projects. These delays can be reduced or prevented by an increased pre-project planning and successful project management as they are one of the most critical success factors of the construction project accomplishment

Reference:

- 1) Akogbe, R. K. T., Feng, X., & Zhou, J. (2013). Importance and ranking evaluation of delay factors for development construction projects in Benin. *KSCE Journal of Civil Engineering*, 17(6), 1213-1222.
- 2) Alaghbari, W. E., Razali A. Kadir, M., Salim, A., & Ernawati. (2007). The significant factors causing delay of building construction projects in Malaysia. *Engineering, Construction and Architectural Management*, 14(2), 192-206.
- 3) Al-Ghafly, M. A. (1995). *Delay in the construction of public utility projects in Saudi Arabia* (Doctoral dissertation, King Fahd University of Petroleum and Minerals).
- 4) Al-Kharashi, A., & Skitmore, M. (2009). Causes of delays in Saudi Arabian public sector construction projects. *Construction Management and Economics*, 27(1), 3-23.



- 5) Assaf, S. A., & Al-Hejji, S. (2006). Causes of delay in large construction projects. *International journal of project management*, 24(4), 349-357.
- 6) Baldwin, A., & Bordoli, D. (2014). *Handbook for construction planning and scheduling*. John Wiley & Sons.
- 7) Doloi, H., Sawhney, A., Iyer, K. C., & Rentala, S. (2012). Analysing factors affecting delays in Indian construction projects. *International Journal of Project Management*, 30(4), 479-489.
- 8) Duran, O. (2006). Current risk management applications in Turkish construction industry, an unpublished Master thesis. *Gaziantep University, Gaziantep*.
- 9) Dvir, D., & Lechler, T. (2004). Plans are nothing, changing plans is everything: the impact of changes on project success. *Research policy*, 33(1), 1-15.
- 10) Dvir, D., Raz, T., & Shenhar, A. J. (2003). An empirical analysis of the relationship between project planning and project success. *International journal of project management*, 21(2), 89-95.
- 11) Enshassi, A., Mohamed, S., & Abushaban, S. (2009). Factors affecting the performance of construction projects in the Gaza strip. *Journal of Civil engineering and Management*, 15(3), 269-280.
- 12) Falqi, I. (2004). Delays in project completion: a comparative study of construction delay factors in Saudi Arabia and the United Kingdom. *Unpublished MSc. Thesis, School of the Built Environment, Heriot-Watt University*.
- 13) Faridi, A. S., & El-Sayegh, S. M. (2006). Significant factors causing delay in the UAE construction industry. *Construction Management and Economics*, 24(11), 1167-1176.
- 14) Frimpong, Y., Oluwoye, J., & Crawford, L. (2003). Causes of delay and cost overruns in construction of groundwater projects in a developing countries;



- Ghana as a case study. *International Journal of project management*, 21(5), 321-326.
- 15) Gajewska, E., & Ropel, M. (2011). Risk Management Practices in a Construction Project—a case study. *Sweden, Chalmers University Of Technology*.
 - 16) Gibson Jr, G. E., Wang, Y. R., Cho, C. S., & Pappas, M. P. (2006). What is preproject planning, anyway?. *Journal of Management in Engineering*, 22(1), 35-42.
 - 17) González, V., Alarcón, L. F., & Mundaca, F. (2008). Investigating the relationship between planning reliability and project performance. *Production Planning and Control*, 19(5), 461-474.
 - 18) Gould, F. E., & Joyce, N. (2009). *Construction project management*. Upper Saddle River, N.J.: Pearson Prentice Hall.
 - 19) Gunduz, M., Nielsen, Y., & Ozdemir, M. (2013). Fuzzy assessment model to estimate the probability of delay in Turkish construction projects. *Journal of Management in Engineering*, 31(4), 04014055.
 - 20) Hanna, A. S., & Skiffington, M. A. (2010). Effect of preconstruction planning effort on sheet metal project performance. *Journal of Construction Engineering and Management*, 136(2), 235-241.
 - 21) Hoseini, E. (2015). *Project Time Planning in Norwegian Construction Industry-An Empirical Study* (Master's thesis, NTNU).
 - 22) Kerzner, H., & Kerzner, H. R. (2017). *Project management: a systems approach to planning, scheduling, and controlling*. John Wiley & Sons.
 - 23) Keung, C. C., & Shen, L. Y. (2012). Measuring the networking performance for contractors in practicing construction management. *Journal of Management in Engineering*, 29(4), 400-406.
 - 24) Khoshgoftar, M., Bakar, A. H. A., & Osman, O. (2010). Causes of delays in Iranian construction projects. *International Journal of Construction Management*, 10(2), 53-69.



- 25) Kim, S. Y., Van Tuan, N., & Ogunlana, S. O. (2009). Quantifying schedule risk in construction projects using Bayesian belief networks. *International Journal of Project Management*, 27(1), 39-50.
- 26) Lester, A. (2006). *Project management, planning and control: managing engineering, construction and manufacturing projects to PMI, APM and BSI standards*. Elsevier.
- 27) Lines, B. C., Sullivan, K. T., Hurtado, K. C., & Savicky, J. (2015). Planning in construction: longitudinal study of pre-contract planning model demonstrates reduction in project cost and schedule growth. *International Journal of Construction Education and Research*, 11(1), 21-39.
- 28) Long, N. D., Ogunlana, S., Quang, T., & Lam, K. C. (2004). Large construction projects in developing countries: a case study from Vietnam. *International Journal of project management*, 22(7), 553-561.
- 29) Mahamid, I., Bruland, A., and Dmaidi, N. (2012). Causes of Delay in Road Construction Projects. *Journal of Management in Engineering*, 28(3), 300-31.
- 30) Majid, I. A. (2006). *Causes and Effects of delays in ACEH Construction Industry* (Doctoral dissertation, Universiti Teknologi Malaysia).
- 31) Mantel, S. J. 2001. *Project management in practice*, New York, Wiley.
- 32) Marzouk, M. M., & El-Rasas, T. I. (2014). Analyzing delay causes in Egyptian construction projects. *Journal of advanced research*, 5(1), 49-55.
- 33) Muya, M., Kaliba, C., Sichombo, B., & Shakantu, W. (2013). Cost escalation, schedule overruns and quality shortfalls on construction projects: The case of Zambia. *International Journal of Construction Management*, 13(1), 53-68.
- 34) Olawale, Y., & Sun, M. (2012). PCIM: Project control and inhibiting-factors management model. *Journal of management in engineering*, 29(1), 60-70.
- 35) PMI (2013). *A Guide to the project management body of knowledge: (PMBOK guide)*, Atlanta, Project Management Institute.
- 36) Pourrostan, T., & Ismail, A. (2011). Significant factors causing and effects of delay in Iranian construction projects. *Australian Journal of Basic and Applied Sciences*, 5(7), 450-456.



- 37) Sambasivan, Murali, and Yau Wen Soon. "Causes and effects of delays in Malaysian construction industry." *International Journal of project management* 25, no. 5 (2007): 517-526.
- 38) Snyder, C. S. (2014). A guide to the project management body of knowledge: PMBOK (®) guide. *Project Management Institute: Newtown Square, PA, USA*.
- 39) Stumpf, G. R. (2000). Schedule delay analysis. *COST ENGINEERING-ANN ARBOR THEN MORGANTOWN-*, 42(7), 32-32.
- 40) Sweis, G., Sweis, R., Hammad, A. A., & Shboul, A. (2008). Delays in construction projects: The case of Jordan. *International Journal of Project Management*, 26(6), 665-674.
- 41) Thomas, H. R., & Ellis Jr, R. D. (2007). Contractor prebid planning principles. *Journal of Construction Engineering and Management*, 133(8), 542-552.
- 42) Toor, S. U. R., & Ogunlana, S. O. (2008). Problems causing delays in major construction projects in Thailand. *Construction management and economics*, 26(4), 395-408.
- 43) Trauner, T. J. (2009). *Construction delays: Understanding them clearly, analyzing them correctly*. Butterworth-Heinemann.
- 44) Trigunarysyah, B. (2004). Constructability practices among construction contractors in Indonesia. *Journal of construction engineering and management*, 130(5), 656-669.
- 45) Vidalis, S. M., & Najafi, F. T. (2002, June). Cost and time overruns in highway construction. In *4th transportation specialty conference of the Canadian society for civil engineering, Canada* (Vol. 5, No. 8).
- 46) Westland, J. (2007). *The Project Management Life Cycle: A Complete Step-By-Step Methodology for Initiating, Planning, Executing & Closing a Project Successf*. Kogan Page Publishers.



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- 47) Yang, J. B., & Wei, P. R. (2010). Causes of delay in the planning and design phases for construction projects. *Journal of Architectural Engineering*, 16(2), 80-83.
- 48) Yang, L. R., Chen, J. H., & Huang, C. F. (2012). Requirements definition and management practice to improve project outcomes. *Journal of Civil Engineering and Management*, 18(1), 114-124.
- 49) ZIDANE, Y. (2012). Project Change in Large Scale Engineering Projects.
- 50) Zou, P. X., Zhang, G., & Wang, J. (2007). Understanding the key risks in construction projects in China. *International Journal of Project Management*, 25(6), 601-614.
- 51) Zwikael, O. (2009). Critical planning processes in construction projects. *Construction Innovation*, 9(4), 372-387.
- 52) Zwikael, O., Pathak, R. D., Singh, G., & Ahmed, S. (2014). The moderating effect of risk on the relationship between planning and success. *International Journal of Project Management*, 32(3), 435-441.
- 53) Saunders, M. N. (2011). *Research methods for business students*, 5/e. Pearson Education India.