The Influence of Construction Manager Experience in Project Accomplishment

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Nowadays, construction projects became more complex, where the responsibility of construction manager is to control and plan the project resources in a professional way to handover the project in terms of time, cost, and quality. The aim of this study is to analyze the affect of the long experience of the construction manager on project success; it aims to identify the capability skills that the construction manager should have to complete the project on time. The finding of this study is to help in understanding the factors that influence the project success through the long experience of the construction manager.

Keywords: resource scheduling, quality control, cost control, construction methodology, detailed working program, project materials

Introduction

Construction management has been developed in last decades by establishing many discipline aiming to contain a multiplicity of concepts, tools, methods, concepts, and experiences whose boundaries are quite blurred (Besner & Hobbs, 2008). Technical competence (planning, control, division of labor) in construction management plays an important role, which is necessary, but insufficient to minimize possible risks during the project. The projects are constructed by people who concurrently represent the highest risk area for each project. Within this area, the factors, such as poor communication, lack of commitment and identification with the targets set, are the biggest threat to the implementation of planned activities of any construction project. Ajibade and Henry (2006) identified the sources of delays caused by the client, the consultants, the contractors and sub-contractors, and those which are not caused by these parties to the design and construction process. Construction firms can't survive without the interference successful of the tools of construction management. Engineering construction management techniques are part of the process of project control and considered as a key factor for successful business of construction. Construction firms are integrating many factors of construction management to ensure the completion date of the project through continuous development of the construction managers of these projects.

It is essential for the construction manager to control and monitor the situation of any project under his control. The professional construction manager not only requires excellent communications skills, but should also be equipped with the technical information pertaining to the project. For the construction management

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practitioners, the incorporation of effective measures for decreasing the failure of projects is essential. The construction management experts have been arguing that the fundamental reason for the failure of construction projects is the insufficient attention towards the activities involved in the early and conceptual stages of project implementation and the lack of proper planning during the mobilization and takeoff phase.

In addition, the inability and inefficiency of some construction managers in predicting the feasibility and success of the project are another cause contributing towards the failures and underachievement of projects. As in the context of a construction project, the manager can achieve results which don’t benefit him but prove to be fruitful for his or her organization. Since construction projects are quite different from the other projects, therefore, a construction project manager should have the technical expertise to understand the arrangement of the project (Kenneth, 2007). He should be able to deal with the various departments in order to execute the project within the resources available. In the construction industry, the success of the construction manager is measured by his ability of completing the work within the specific time and within the resources allocated for this project.

Construction manager should have enough technical site experience and management skills as well, in construction industry, the management of a project is usually assigned to an individual engineer called project manager or construction manager, depending upon the size and period of the project; he can participate directly in the activities that contain it, but mainly it focuses on the coordination and control of the various elements and components and other various stakeholders with the objective of minimizing the probability of delay or failure. In large-scale projects, construction management can be delegated to more than one person where they all should be aware of the construction methodology of the project. Usually, they all report to one appointed responsible person called project director/manager. This is accompanied by other people who are concerned with the operation of the management of parts of the project in accordance with a view to system components or specific areas. These are sometimes called functional managers. As any other human effort whether projects are implemented or released in an environment, it aims to subject to certain constraints. Traditionally, these constraints are listed as scope/quality, time and cost/resources. The image of the triangle of project construction management (where each side represents a constraint) is often used to represent their correlation: Each constraint cannot be changed without impacting the other two, i.e. each parameter is a function of the other two. A further variant of this system of constraints among the quality of the intent turns it into a tetrahedron with four inter-related constraints.

The aim of this study is to find out the effect of the experienced construction manager on the project success. Since a project tends to introduce different ideas into its field, therefore, it is important for the construction manager to have some experience under his or her belt. The experienced construction manager adopts a completely different outlook towards the work and will treat his or her subjects differently as compared to a project manager who is fresh or doesn’t have the experience under his or her belt. Therefore, this research study tends to gauge the outcomes of a project if it inculcates an experienced construction manager.

**Literature Review**

In construction engineering projects, a delay in handing over the project means a time overrun beyond the date that the project parties have agreed upon for the completion date. From the owner’s point of view, a delay generally leads to loss of revenue especially if the project belongs to governments. It can also cause a big suffer to the contractors by making them suffer in productivity and prolongation of the additional costs.
The contractor’s construction manager is the person who has the overall responsibility for the successful planning and execution of a project. One of his responsibilities is meeting the project target by achieving the completion of the project within time under budget and in accordance with the required performance and quality level. The question is that every contractor’s construction efficiency and performance of the construction manager of carrying out manager is capable to fulfill this responsibility. In most of construction projects, many factors affect his duties as it should be to achieve the project targets. Some of these factors are the lack of experience in contract terminologies, wrong interpretation of contract terms, lack of information in condition of contract (traditional type), and difficulties in communication with the technical site staff (Anderson, 1997). Yu, Shen, and Chan (2010) confirmed that the design requirements which are a translation of the client needs, site, and environmental requirements, and construction requirements of the actual construction which derive from the design activity, should be fully clear to the construction manager of the project. Being (the construction manager) unfamiliar in construction projects and design method, the client might fail to voice out his opinion at an early stage which might lead to big delay.

Researchers have found many reasons that contribute to project delays, such as the lack of knowledge and experience of incorporating the conditions and specifications of contract to the details and the procedure of the construction process. Bramble and Callahan (1992) confirmed that a project may be delayed as a result of the direct action of major parties or of their failure to act especially if they have a duty. Also they added that outside forces could be intervening to delay a project. Assaf and Mohammed (1995) studied the causes of delay in large building projects in Saudi Arabia and identified material related delays as the main cause of project delay. Lack of experience in understanding the principles of construction management by the top management of the contractor’s sectors may create conflicts and disputes during execution. Understanding the technology of the work and the characteristics of the project by the construction manager helps him to deal with many variables to complete the project on time without any delay in terms of time, cost, and quality. Construction is certainly a special branch of material production, within which the creation of new, reconstruction and expansion of existing facilities, buildings and facilities in both the production and non-productive must take place. The main task of capital construction is to build productive capacity of the country on a new technical basis. There are ways of improving the regulation of construction activities which are closely related to the improvement of the legal aspects of entrepreneurship and it is a precondition for the functioning of all construction sites. Legal regulation of capital construction is included in the competence of the many countries. Legislation of the subjects may be regulated by only those questions of construction, which are directly attributed to their jurisdiction (Angelides, 1999). Large national and international mega-projects are often structured around a hierarchy of a number of interrelated projects and subprojects stated by Aramo-Immonen and Vanharanta (2009).

Management of construction projects can be carried out by specially trained professionals with necessary knowledge and possess of sufficient practical experience. The companies carry out construction supervision and project management in the construction of any complexity. They even use modern management techniques and their own planning and reporting tools for project management. They adapt themselves to good conditions in various countries thus avoiding unnecessary bureaucracy and to achieve the final result. One thing must be kept in mind that bringing an independent management company for the project is necessary.

They need to be sure of the systemic approach to the management process and the final result. Providing engineering and consulting services of design, calculation and analytical, organizational and research character
are of immense importance. Preparation of feasibility studies for construction projects is translated as making recommendations regarding the organization of construction, production and management, sales, maintenance and operation of residential, industrial, infrastructural and other facilities. Receiving and processing initial data for designing of construction projects is interpreted as preparation of specifications for design and technical support for investment and construction projects at the pre-design, design and subsequent stages of their implementation; technical supervision over the course of construction, repair and finishing works with a complex of expert verification activities carried out with optimal regularity, and allowing for during the project the exact observance of defined project deadlines, scope, cost, and quality of the work undertaken and construction materials. Bateman and Snell (2011) stated that the steps of designing effective control system are establishing valid performance standard and maintaining open communication along with using multiple approach. This is another support statement that the construction manager of every form should be familiar of designing the duties and tasks through open clear communication policy.

Construction project is referred as a combination of many site activities; therefore, project activities should be clear to determine the project constraints. In a course of a construction project, the construction manager can face several constraints which can be identified but not limited to time, cost, and quality constraints. Time constraints are not limited to unrealistic period required for handing over the project, shortage duration of design, and late response of the consultant to the construction manager technical inquires during construction phase. Time constraints for quality are not limited to poor supervision during construction, the quality of the components and method of protecting the produced work. The time constraints for the cost are not limited to the bad workman ship, the unclear details and specifications and continuous variations and changes.

The time constraint indicates the amount of time available to complete the project. The constraint cost/resource is the available budget for the project and at the same time, the set of resources is available to the project (there is a clear correlation between direct cost and allocated resources). The bond order/quality is what needs to be done to achieve the results expected from the project both in terms of requirements of quality criteria/performance.

These three constraints are closely related: Increasing the scope typically means increased time and cost/project resources, reducing the time often requires higher costs (the greatest resources) and/or a purpose narrower, and a tight budget (less resources) may imply longer times and/or a reduction of the purpose (Hyvari, 2005). It is precisely the theory of project management that provides the tools and techniques that enable the project team to organize their work within this system of constraints by optimizing the whole. An alternative representation of the constraints is to select variables such as cost, time, and human resources. If you need to finish a project in less time, you can increase the individuals assigned, which will also increase the costs for the likely increased inefficiencies in resource allocation. The estimated budget of developing a project primarily depends on several variables: the quantity and quality of resources allocated, labor costs, costs of materials and/or services purchased externally, risk management (e.g., how much is spent/allocated to mitigate the major risk), cost control and administration of the project, equipment and instruments, revaluation of cost (in case of multi-year projects), and indirect costs.

The purpose of the project, namely the results that must be produced, is strongly correlated to the quality and/or performance to what must be released. The quality produced is the accuracy with which the results are adhering to agreed requirements, in the sense that fully meet the requirements and possibly add further value to
the buyer. Ensuring satisfactory adhesion (zero surprises) needs to invest more effort in the engagement phase of the project and to define as precisely as possible the requirements and acceptance criteria, that will be used to evaluate the results produced (characteristics and performance).

The dependencies between tasks and internal ones by external events (e.g. the supply of products or materials that serve as input for certain tasks) may have an impact on the duration of the project, often in real-world projects by introducing the need to revise the schedule above. Other factors affect the timing of the availability of resources, rather than the assumption (in the estimation phase) productivity/performance significantly different from the actual real team. In most medium-sized projects measuring the progress, control and adaptation of the plan are part of the regular routine activities of project managers (Besner & Hobbs, 2008). Time is not considered as a cost or a resource, given that the project manager cannot control the speed at which he spends, and this makes the real difference with the other constraints.

For a successful project in the construction industry, it requires complex knowledge of the various management areas: technical experience, good personality, general management, financial management, personnel management, and many others like technical knowledge (objects, organizational structure, documentation process and procedures). Bredillet (2008) said that it is very important to have skills of limited resources and information uncertainty. The aim should be to develop or refine a project management technique, to explore the experience of project teams to enable better understanding, make sense of what actually happens in project, or develop performance metrics or tools. It is essential for the construction manager to be familiar in the tools and implications of project management to control the operations of the activities regularly. It is a part of strategic plan of the organization to develop and adopt strategic leadership which is to help firms successfully navigate the dynamic and uncertain environment in which they compete today. The strategic leadership needed in 21st century firms is involved with building company resources and capabilities with an emphasis on intangible human capital and social capital (Hitt & Ireland, 2002).

**Methodology**

To achieve the research goals and objectives, a combination of comprehensive research methods was adopted in this study including literature review, questionnaire, and quantitative and qualitative data analysis. This part focuses on the theoretical background of various research methodologies, presents the overall research process, and discusses the research methods adopted in each stage.

This study is prepared based on a mix approach, meaning that both quantitative and qualitative means analysis have been incorporated into the study. This would be done in order to find accurate results to the best possible extent. Other than this, information will also be infused from other sources of information as long as they are relevant to the context of the study and the problem identified. This analysis is not only important in order to interpret the findings but also to set the frame of reference for solutions and recommendations parts of the study. The importance of depended and independent variables cannot be ignored not only in frame of this research but in the frame of any other research (Denscombe, 2007). In order to obtain effective results, organization of the information holds huge importance (Cronbach, 2005). This study has been divided into three fractions, which deal with research design, research approach, and ethical aspects. The first fraction deals with the manner in which the research will be pursued. Second fraction of this chapter relates to the methods via which the information will be collected and analyzed. The last part or fraction of the paper inculcates the ethical aspects of the research.
Furthermore, many other methods could be adopted to come out with the results such as research opinion it helps to identify the most suitable method based on which the methodology should be constructed (Holliday, 2002).

The aim of this section is to describe the various methods that are available to the author when conducting the study and offering definitions and explanations.

**Research Approach**

The methodology was devised from the analysis of the two main approaches to data collection: quantitative and qualitative research, both of which are defined in detail below in order to allow the author a satisfactory understanding of how these methods are utilized in order to develop a detailed investigation. The research study was carried out in a way that the veracity of the research is maintained and the effects that tend to be negative would diminish the future research potential. The research study was conducted in a capable manner, in order to meet the objectives of the research study without any biasness. The name of the respondent was not asked instead of that every respondent was identified by code. This was done solely to protect the identity of the respondent to avoid any biases. The study topic was chosen based on the best scientific judgment and the assessment of the possible benefits to the respondents and also the society (Wolf, 2006).

**Quantitative Research**

In short, quantitative analysis is the examination of data collected via survey techniques through statistical methods in order to ensure that the data collected is both reliable and significant. Quantitative tools provide much more depth to understand the reasons behind the scope of work, moreover, when taking a decision of strategic nature in a project. The qualitative tools are included to build upon the opinions or the findings which have already established themselves as functional (Creswell, 2003). Quantitative method also tends to be more scientific in nature as it makes use of wide variety of tools before framing the results. As it uses a wide variety of data along with tools, it also reduces the biasness involved. Davies (2007) has stated that doing a successful research project using qualitative and quantitative method is very essential where differences of context of survey, questionnaire, sampling, and interviews should be identified to help the researchers to come out with an accurate data.

Questionnaire surveys are a method of collecting data by asking respondents to complete a questionnaire. A questionnaire may include a series of set questions, and either provides a space for an answer or gives a number of fixed alternatives from which the respondent has to select. Author will frequently make a sample in order to understand or take views of some populations. This form of data collection is the most widely used source of primary research amongst researcher as it provided access to a wide range of professionals which would normally be beyond the reach of most researchers (Naoum, 2004).

**Interviews**

A formal interview may be conducted as opportunity permits to the formal pre-arranged interview; whilst an informal interview demands a more probing, spontaneous, and unstructured technique governed by the situation rather than by the topic of interest. The purpose of this study is to identify the effect of the experience construction manager on project success. The sources of the literature were based on:

- books published in Engineering Project Management;
- books published in Engineering and Construction Management;
- published literature aspects of Project Management;
• articles published in International Journals of Project Management;
• the technical and managerial experiences of the researcher.

These sources make the author to develop the strategies of the consultancy firms/procedures of design to be considered effectively to reduce the cause of the delay. Sometimes case studies are very useful to determine the causes of delay. Case studies are appropriate to projects that are significant and representatives (Yin, 2009)

Delivering the projects on time by applying the techniques and principles of construction management is one of the main concerns of the project participants. Finding and analyzing the factors of the project delays is helping to mitigate the disputes of the project participants. The literature study focuses on the previous studies which identified and determined the necessity of the applications of construction management into projects. Many projects suffer from delay and construction delays are common in civil engineering projects. All project participants agreed that construction delays are expensive.

**Questionnaire Survey**

The questionnaire survey was developed and prepared to evaluate the perceptions of the construction project manager to the relative importance of construction delay factors. The aim of the questionnaire survey is to determine the responsibilities of the construction manager and the approaches used to minimize the effect of the delay, and to determine the kind of the delay in construction and to obtain the feedback on procedure used to mitigate the effect of delay.

Based on literature review, specific questions have been developed to accommodate the aim of the study. These questions focus on examining and defining direction of the study. The question of this study is to determine the possibility of using research questions since these questions are directly linked to the problem statement. The answers of the following questions will determine the relationship between the experience of the construction manager and his effect on project successes:

• What is the level of understanding of all construction managers the planning process and software’s techniques?
• What is the level of experience that construction manager should have once he is appointed for any project?
• How is the approach of experience construction manager different from a non-experienced construction manager?
• What is the level of experience of construction managers in general forms of international contracts conditions of construction projects roles?
• What is the classification of the construction management designed for the construction engineering?
• How construction managers are assessing the potential risk in any project?

**Successful Construction Management**

The contractor’s construction manager should be fully aware of the applicable functions and processes throughout the site working and consider the basic concepts, principles, systems, and procedures which impact the management functions. Also the contractor’s construction manager needs to understand the characteristics of the project and technical difficulties in order to deal with many variables which he must consider in successfully delivering the project on time without any delay. Once the contractor is signed to undertake any
construction project, he should focus on many activities relating to construction project management to enable him to hand the project on time without any problem. It is also important to understand the effective site management to increase the efficiency of the company policy, strategy, and the system along with the construction technology and production method. These aspects contribute to the project success.

The contractor project manager should be fully aware of the mission, objectives, policies, strengths, and weaknesses of the construction firm and its grade at the local market. He should have technical and managerial knowledge of construction, especially method of preparing and planning work procedures of other activities such as MEP works and he should be able to establish the framework of critical activities.

He also should be able to read, understand, and verify the general conditions of the contracts and particular conditions along with drawings, specifications, and bill of quantities in details, and he has to identify the components of the project in details. Black and Gregersen (1997) stated that supervisors are more concerned with facilitating group work practices, training staff and resolving work related data. So a part of construction manager is to make sure that his team in the project is fully trained and practiced. The principles of management concepts are applicable to the site management of construction works: site organization, planning, progressing, cost control, plant and material procurement; and these factors should be fully understood and recognized by the contractor.

Although specific duties and responsibilities are placed upon the principal contractor construction manager under various forms of contract, the management systems and procedures used in meeting the site management of construction works are applicable generally to all construction contracts. Once the contract signed for construction works, the main contractor is charged with delivering the project to the client’s requirements for time, cost, and quality.

The company organization will provide strategic vision, policies, objectives, and senior management commitment, while the project organization will provide safe working procedures in delivering the construction project on site where construction manager should be involved to handover the project on time, it is essential that the firm is interactive with and mutually supportive of the project organization on site. To facilitate the translation and application of the management systems to its construction projects, the company will need to establish robust site organization. An effective project, site, or structure will provide the means for clear lines of responsibility and communication to be established within the main organization. Russo and Schoemaker (2001) stated that if the behavior of the senior managers positively or negatively affects the decision making practices throughout the operations, this might affect the decision making process of the construction manager which might cause some delays to the project progress.

Efficiency is one of the components of the management of any construction project. The key aspects contributing to this component are the functions of the site manager, the management styles adopted, organizational structure and the corporate planning processes, and motivation of staff. All of these can be adopted under the umbrella of achieving best practice for the principal contracting organization.

In construction project, there is a basic requirement to monitor and control all activities and all resources by the construction manager. Planning, the process of determining and analyzing the resources required for a project, and programming or sequencing of those resources using any one or more of a number of program types are two of the most traditional of all construction management functions. The important aspect of planning is the project’s construction. Key element of planning is the preparation of method statements.
Construction project manager should also be very familiar in other management functions such as quality control and assurance, environmental health and safety. Classified by their standards-based systems, management approach to construction planning is established and systematized by those programming methods and tools used. The most commonly utilized methods of programming can be bar, charts, and network analysis. Tools exist to aid the application of these methods and these are computer-based and utilized a variety of software packages.

Construction management practice of making workable site layout and supervisory structure is essential to put in place the necessary channels of communication, authority and control among the members of the site team.

Construction managers should have enough information about planning of materials which is necessary to the success of the project. Plant and materials planning for construction projects depend upon the planning processes at both corporate and project levels. The critical link between strategic planning and operational planning must be recognized within the management techniques.

**Risk Analysis in Construction Industry**

The construction industry is an industry that has both substantial risks (project-specific risks, high demand volatility, etc.), and traditional risks. Risk analysis can be done by following a logical process starting with a phase identification and risk assessment and then manage them, analyze, and implement the actions of withdrawal, reduction to control the residual risks. It is necessary to note that pure risk analysis for the construction industry must consider the various events that can cause property damage or consequential damages, both the contractor and the owner of the work. There is no doubt that the two large sectors of construction industry which are infrastructure and projects are fully aware of the process of identifying the risk. The risks to which are subject of a road construction are quite different in certain respects from those that affect a city project, for an example, the probability of occurrence of a landslide on a mountain road is higher than that in a building under construction in the flat areas of a city (Monahan, 2000). Risks can be identified and analyzed from a classification table of the major risk categories broken down into subcategories for each field of activity and profession. The risk breakdown analysis in construction industry could be divided into many kind risks like, contractual risks, legal risks, strategic risk, risk decision making, commercial risks, technological risks, contractual risks, financial risk, political risks, social risks, and environmental risks.

Another approach is to analyze the types of risks throughout the project life cycle. New risks will be identified during brainstorming sessions with business experts concerned and dedicated to the identification and characterization of these new risks on the project. To determine the criticality of each risk, an assessment of the probability of occurrence and impact will be estimated by the construction manager. Criticality is the product of the probability of its occurrence by the impact that the risk on the project has seen the entire company. Then the criticality level is acceptable not for the project but for the company. Preventive actions to reduce the probability of occurrence addressing the causes will be developed taking the additional costs generated by the relevant risk into account. The whole forms the prevention plan. Remedial actions to reduce the impact of known risk acting on effects will be developed taking into account the additional cost generated against the risk occurring. It is extremely important that the construction manager must do full analysis to control, share, avoid, or transfer the risk to avoid any problem during the work progress of the project.
Planning

There are essential requirements on all construction projects to plan, monitor, and control activities against the project’s duration. Planning is a functional process carried out at specific phases of the project: pre-tender, pre-contract, and contract to be considered by the construction manager and planning engineer.

Planning is a process of analyzing and organizing all the resources necessary to precede project. The core element of planning is the establishment of a program which reflects the planning in relation to real time. In practical terms, construction planning is the procedures of determining the method, sequence, labor, plant, and equipment required to build the project. In construction projects, planning needs the detailed consideration of each item of work—operation—which combines to form the works, so that construction manager can complete the project on time. The construction manager is fully responsible to report the actual work progress within the planned work on daily basis. Benefits of planning in construction industry are to determine the sequence of the work activities, updating the project latest information to management, informing the management about the realistic work program, keeping monitoring the material order, controlling the production rate of each of project resources to keep smooth progress, and indicating the starting and finishing dates of the activities.

Technical and Administrative Obligation of the Construction Manager

Construction activities in projects require more detailed to its planning, organization, programming etc. where contractor’s construction manager should establish procedures to control the changes and to monitor the progress of the work through proper understanding of cost estimates and analysis. Documents records and control and materials orders and delivery are one of the major tasks that he should be more familiar to avoid any delay for any work activities in the project.

Other important role of contractor’s construction manager is to be fully aware in dealing with the domestic and nominated sub-contractor. Communication is a part of the principles of dealing with the sub-contractor. The construction manager of the main contractor shall select the sub-contractor on the basis of their ability to meet the contract requirement. The selection of the sub-contractor shall be dependent upon the type of work, period, and quality, on the records of sub-contractor previously demonstrated capability and performance. Therefore, the project manager must prepare by himself the condition of the sub-contract agreement and terms such as work information, starting completion, mode of payments, disputes, insurance, and termination and ensure that these are compatible with the overall project objectives. Special care needs to be exercised in selection and choosing the lowest quotation of the sub-contractor. This depends on the personality, experience, and communication of the contractor’s project manager who should be strong enough to take a proper decision.

Data Analysis

This section of study aims to perform the analysis of the responses rendered through the questionnaire. In order to analyze the data, frequencies are calculated to cover the responses by the participants. Furthermore, to make the data on more accurate lines, this paper drops analysis to find out the relationship among variables. This result analysis is of quite meaning as it aims to analyze the data which has been collected as a result of the above methodology. It is important for a researcher to analyze the data as per the requirements. In Table 1, list of designed questions distributed to construction managers from different construction firms that have executed different types of projects is shown.
Table 1

*Proposed Designed Questions Distributed to Constructing Managers*

<table>
<thead>
<tr>
<th>Question number (Q.N.)</th>
<th>Questions</th>
<th>Validity</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>What is the level of your experience in construction management industry?</td>
<td>100</td>
<td>2.47</td>
<td>1.086</td>
</tr>
<tr>
<td>2</td>
<td>What is the biggest size of project that you have ever managed like project duration or project time?</td>
<td>100</td>
<td>2.38</td>
<td>1.089</td>
</tr>
<tr>
<td>3</td>
<td>Understanding and simplicity of use can be rated as a construction management tool by the team like scope of the work, fishbone diagram, network diagram, critical bath analysis, work breakdown structure, and bar chart.</td>
<td>100</td>
<td>4.32</td>
<td>1.874</td>
</tr>
<tr>
<td>4</td>
<td>How do you rate construction management tools for regular update like scope of the work, fishbone diagram, network diagram, critical bath analysis, work breakdown structure, and bar chart?</td>
<td>100</td>
<td>3.8</td>
<td>1.938</td>
</tr>
<tr>
<td>5</td>
<td>Please rate the following construction management tools for continuous follow-up like scope of the work, fishbone diagram, network diagram, critical bath analysis, work breakdown structure, and bar chart.</td>
<td>100</td>
<td>3.7</td>
<td>2.1075</td>
</tr>
<tr>
<td>6</td>
<td>Do you think that cost effectiveness, meeting the standards, risk assessment and completion on time can participate to the project success?</td>
<td>100</td>
<td>2.96</td>
<td>1.455</td>
</tr>
<tr>
<td>7</td>
<td>Rating of influence and effect of construction management techniques on project success.</td>
<td>100</td>
<td>2.2</td>
<td>0.8454</td>
</tr>
</tbody>
</table>

Regarding the level of experience of the construction managers who has requested to respond, as shown in Table 1 (Q.N. 1), the value of standard deviation is 1.086, which means that the variables are notably increasing across the mean 2.44. As rendered based on Figure 1, the experience of most of the respondents stood in between seven to 15 years. This indicates that construction managers who participated should have enough knowledge about the categories and classifications of the construction management firms.

Regarding the size, type, and the project duration of projects which have been completed by the construction managers as shown in Table 1 (Q.N. 2), value of standard deviation of 1.089 shows that the results are greatly spread across the mean value of 2.38, as shown in Figure 2, which suggests that around 29% of the respondents devoted themselves in a time frame of more than five months. In addition, the findings further confirm that around 260 projects stood for less than one month. In the line of findings, it can be safely said that the participants were in action in the project duration which exceeded more than five months.
Regarding the simplicity and implications of construction management process which has been confirmed by the participants shown in Table 1 (Q.N. 3), the standard deviation value 1.874 shows that the results are reasonably spread across the mean value of 4.3 with the standard deviation value of 1.87. As shown in Figure 3, 22% of the respondents confirmed and aligned themselves with the network diagram whereas; 21% raised their voice in favor of bar chart. However, other ideas which were utilized by the participants are identified as work break down structure, signaling work definition, critical path analysis, and fishbone diagram respectively.

In Table 1 (Q.N. 4) regarding rating and priorities of construction management techniques, the results are spread across mean to the percentage of 1.938 as shown by the value of standard deviation. Referring to Figure 4, project review along with breakdown structure was utilized by most of the participants as a tool to render update opportunity in the context of the construction projects.
Project review along with breakdown structure was utilized by most of the participants as a tool to render update opportunity in the context of the construction projects. This information also suggests that these tools are used mostly to collect data by the surveyed organizations. It further paints the picture that information is also circulated via such tools.

Regarding Table 1 (Q.N. 5), it is followed up by the participants for the construction management tools as shown that, the variables are considerably increasing across the mean with the value of standard deviation 2.1075. Work breakdown structure (22%) and establishing work definition (16%) are most possible for following up the projects as shown in Figure 5. Project review (8%) is used by the organization least for ensuring traceability.

In Table 1, (Q.N. 6) meeting standards, cost effectiveness, and risk assessment are the priorities of
construction managers in the firms where the results are spread across mean to the percentage of 1.455 as indicated by the value of standard deviation. As shown in Figure 6, the aspect which required immediate attention was meeting the standard and time completion, followed by risk assessment and analysis, while cost efficiency in this regard appeared to be at the bottom of the list stated by the participants.

![Project management success measures](image)

*Figure 6. Progress measures.*

![Project management techniques effects project success](image)

*Figure 7. Project management techniques.*

Regarding Table 1 (Q.N. 7), results show that more than 40% of respondents strongly agree to use the implications of construction management and results spread across the mean to the percentage of 0.8454 as shown by the value of standard deviation. As per data of Figure 7, it shows that the implication of project management techniques is the most important tools that construction managers are using to achieve and maintain the project success.
The data analysis reveals that most of the participants were of the view that construction management technique is very important and most essential, when it comes to project completion and determining the success of the project. Meantime, only 37% of the respondents were of the view that construction management implications and techniques cannot guarantee and assure the success of the project (Table 2).

Table 2

<table>
<thead>
<tr>
<th>Project Management Techniques Influence Project Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
</tr>
<tr>
<td>Strongly agree</td>
</tr>
<tr>
<td>Agree</td>
</tr>
<tr>
<td>Disagree</td>
</tr>
<tr>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Conclusions

The contractor construction manager should have enough effective information about the skills of communication and coordination to help him do the proper external and internal negotiation with all of the project team. The construction project manager should be fully familiar with the contractual relationship between his firm and other nominated and domestic. Other important task of the contractor’s construction manager, which relates directly to his responsibilities and obligations, is to set up the project team who is qualified enough to work along with him. This might be reflected positively to the work progress and the handing over date of the project (Anderson, 1997). Appointing one or two professional engineers on the site to monitor all work activities in one time, while the construction manager needs to be experienced in conditions of contracts, belongs to the project. It is essential to have the experience of appropriate planning methods which should be monitored and implemented on weekly basis by the project team managed by the construction manager. The necessary data and information about the project should be furnished by senior management to the construction manager to help him plan in advance ordering the materials of construction. Level of quality control is one of the essential requirements that the construction manager should be familiar with during the operation process. Systematic process should be adopted by the team under his supervision. The contractor construction manager is required to develop a suitable construction methodology during the mobilization period, it helps him and the team work to prepare and implement the work within sequences complying with the project duration. Construction contractor’s managers cannot operate without strategies for quality management to translate these into effective operational practice on the construction projects to ensure the completion of project on time. During operations of construction activities, he should prepare the health and safety plan based on the construction methodology. Construction manager should conduct regular and weekly site meetings to monitor, evaluate, and review the work progress including the assessment of the risk analysis and level of their impacts. Regular follow-up of the work activities as per the planned schedule is a part of the responsibilities of the construction manager. Sawyer (1990) stated that the program as stated in the tender documents, is limited to the number of days forming the time for completion, where the works are to be completed in sections or parts, the number of days for the time for completion such sections or parts will also be given. The responsibility of contractor’s construction manager is to build the project, according to the contract documentations within the required cost and time budgets and the specified standards. The execution of the contract is administrated by
the project manager who should have the qualified technical staff, enough resources along with a group of experienced subcontractors.

John and Woodaward (1997) stated that the first major responsibility of construction managers will be to define the scope and the content of the project. The project manager will have to be experienced in the type of the project and will have to be sufficiently strong character to instruct the team of their responsibilities. No proper coordination is with the consultant on queries.

The construction manager should have enough experience in raising technical inquiries during bidding, tendering, and tendering drawings verification. Many contracting organizations consider the construction managers positions as a middle position where they should report to the directors. Sayles (1989) focused on middle management and the skills and conceptual understanding required to orchestrate five critical tasks, often simultaneously: monitoring work flows, motivating subordinates, negotiating lateral relationships, working the hierarchy, and introducing change in structure and technology.

**Recommendations**

The role of construction manager is very important; it further aims to grow if he is in any way associated to construction industry. The following recommended actions should be considered by the contractor construction manager who ensures the delivery of the project on time. He has to determine the necessary resources to undertake the project by construction planning. Preparing detailed construction method including testing and commissioning plan is a major task he has to do to implement the strategy of execution. He should outline in details the contractual and technical obligations to mitigate any potential conflict which might arise during construction phase. He must formulate an executable work sequence based on planning and programming process. Construction manager should be equipped with the technical knowledge in order to assist his or her workers; moreover, he should be also aware of the managerial procedures which should be followed. Thus, in the light of the existing papers, it can be safely stated that an experience construction manager will most likely complete the project within the time limits and the rendered resources. Moreover, for a project to achieve its set objectives, there are certain steps which need to be defined by the firm itself before handing over the project to the construction manager. This would help him and the organization to hand it over on time, thus these steps could be determined as:

- Normal balanced model of effectiveness in construction, which introduces methods of handing over projects on time;
- Creating a systematic form of achievement, which helps the organization to adopt new techniques to hand over projects on time;
- Introducing a new standard model to maintain the performance of achieving the internal quality system and control process through an approved documentation system;
- Working within an approved systematic recruitment process/system to ensure that the appointed construction managers and the technical staff are qualified enough for certain types of construction projects;
- Adopting certain policy of continues training advising all construction managers, site engineers, and projects managers to be trained regularly in the field of construction management, understanding its implication and processes.

Early studies on the effectiveness of the organization attach great importance to the achievement of certain goals or end products. The goal model of effectiveness has been tested and validated more than the other
models in academic research. The rational goal model of effectiveness is concerned with productivity growth, quality, performance, and efficiency (Kenneth, 2007). This model recognizes the sense of purpose and rational decision-making projects such as the fundamental determinants of organizational effectiveness as key variables that may facilitate success. The importance of more effective project management cannot be underestimated. Kerzner (2009) stated that the implementation of project management within an organization requires strong executive support and an implementation team that is dedicated to make project management work. This helps the facilitating successes of developing the organization structure who can implement decisions. Kerzner argued that effective project management requires sound decision making, goal setting through the prioritization and effective communication with stakeholders in the project implementation.

References


