Project Planning and Control in a Developing Economy: Implementation and Realisation

H. Abdul-Rahman, M. Othman, N. Zakaria, I. A. Yahya,
O. Mohamed and L. C. Lan

Centre for Project and Facilities Management (CPFM)
Faculty of the Built Environment,
University of Malaya

Abstract

In the competitive and uncertain environment of the construction industry, the ability to deliver end products with the required quality, schedule and budget is vital to the survival of any construction-related firm. Before embarking on any project, realistic planning and, consequently, a control procedure must be in place to enable the parties to manage the project with sufficient degree of authority and certainty.

This paper addresses issues associated with the implementation of project planning and control, identification of impacts in the implementation of project planning and the critical success factors of project planning. A questionnaire survey was conducted on construction professionals and contractors involved in the running of construction projects. The survey results showed that common problems associated with the project planning and control are the lack of experienced staff and poor coordination by the contractor.

During site operation, a delay in decision making aggravates the effect of poor planning and control and much of the effect of project planning rests on the pro-activeness of experienced staff. The positive impact associated with proper planning and control is the high probability of finishing the project on time while the negative impact is that it is a time-consuming and costly process. The critical success factors identified from the survey are Excellent Teamwork and Experienced Team.

Keywords : *the impacts of project planning and control, project planning, problems, solution*

Introduction

Planning the construction project is vital to ensure that work is carried out to the required quality, within the specified time and according to budget. Due to the nature of construction work in which many uncertainties are involved, divergences from the original plan are common. When the differences between the plan and the actual work performance are large, control actions are taken to bring the actual performance back on course with the original plan.

In monitoring project performance, measurements are taken and compared with the desired or expected values as the project progresses. However, the typical measurements made are limited in number because of the cost of data collection and restrictions by company policy and precedence (Al-Jibouri, 2002). Due to the nature of data available, it is difficult to determine the actual performance in a project. The complexity and the limited number of measurements will provide a less than complete picture of the actual performance.

The main aim of this paper is to ascertain the problems associated with the implementation of project planning

and control from the viewpoints of construction consultants and contractors in a developing country. The second objective is to identify the positive and negative impacts in implementing project planning and control from the perspectives of the parties involved in the study. Finally, the critical success factors are identified for successful planning and project performance.

Project Planning – An Overview

Construction projects need to be properly planned. Project planning is a fundamental necessity for the construction industry players to get specific results with a definite set of objectives. It is defined as the process of identifying all the activities necessary to complete the project successfully (Oberlender, 2000). It has also been described by Westney (1985) as the process of breaking a project down into specific tasks, and defining the sequence in which those tasks can or must be performed. According to Payne *et al* (1996), project planning means planning methods, choosing between 'in-house' services and external suppliers or constructors, deciding on cash flow for the cost plan or budget, and deciding on the schedule of operations or the timing plan.

Spice (2003) highlighted that the project plan can be used to make forecasts, estimate impacts of risks and to make contingency plans for the consequences of delays or other changes in the plan. Mawdesley *et al* (1997) identified the objectives for project planning as a) to provide a basis for estimating time and cost, b) to predict the timing of activities, their sequence and the total construction period, c) to provide a basis for claims evaluation, in particular extension of time entitlement calculations, d) to predict the level of labour, staff, plant and material, and e) to enable the safety, quality and environmental impact of the work to be properly considered. From the management viewpoint, the objectives of proper project planning, include: a) to reduce the consequence of uncertainties and risks, b) to persuade people to perform sequential tasks to ensure that the available resources are best utilised at all times, and c) to provide the basis for project control (Lee, 1998).

In any construction project, the three inter-related factors of time, money and quality need to be controlled (Mawdesley, et al., 1997). An important effort in overall project control is the accuracy and detail of the first estimate that becomes the control document for future design decisions. The simplest definition of project controlling, according to Babcock (1991), is compelling events to conform to plans. Control entails seeing that project tasks are carried out according to plan and to avoid large deviations from the plan (Roman, 1986).

Controlling a project is done by measuring performance and correcting deviation from the project plan (Lee, 1998). It begins with the identification of the owner's objectives and ends when those objectives have been met (Gould and Joyce, 2002). Controlling a construction project fulfils the need for a) spotting mistakes, b) recognizing lack of work progress, and c) identifying areas of poor quality (Mawdesley *et al* (1997)). Gould and Joyce (2002) identified that the purposes of project control are to guarantee that the project's design, budget and schedule are met by the project and to identify deviation early when any objective begins to slip so that appropriate correction can be made.

Roman (1986) pointed out that the objectives of project control are:

a) to minimize loss and the consequences of poor performance, and
b) to enhance project team and client relations and prevent internal disequilibrium and to promote communication among functional groups.

The Necessity of Construction Project Planning and Control

Some of the reasons why planning and control is necessary include:

a) to prepare for unforeseen factors to reduce consequences of uncertainties and risks (Lee, 1998 and Roman, 1986)
b) to persuade teams to perform tasks to ensure project's objectives are met (ie. timely completion, optimal use of resources etc) (Chan, 2002 and Gould and Joyce, 2002)
c) to provide basic coordination (Bennett, 2000)
d) to avoid communication breakdown (Roman, 1986 and Ahuja, 1994)
e) to fulfill financier's requirement (Ahuja, 1994) and
f) to provide continuity of personnel when experienced personnel leaves (Ahuja, 1994).

Measuring Project Performance

Performance of a project reflects the project's success or failure. In the context of construction project performance, project performance is the achievement of the project at the end of the construction. Payne, et al. (1996) pointed out that once the project begins, project performance is periodically determined so that any necessary adjustments can be made quickly. According to Gould and Joyce (2002), the evaluation of actual performance to planned performance is a critical and recurring step in the control process.

Hendrickson and Au (1989) mentioned that the key factors for unsuccessful projects are ill defined scope, poor management, poor planning, breakdown in communication between engineering and construction, unrealistic scope, schedules and budgets, many changes at various stages of progress and lack of good project control.

Problems In Implementing Construction Project Planning And Control

Problems that usually occur during the implementation of planning and control faced by the project planning team includes:

(1) Communication failure (Malliet, 2001),
(2) Disinterest in project planning and control due to perceived poor returns from its implementation (Clarke, 1999 and Cox, 1993),
(3) lack of information input and feedback for planning and control due to its image as a 'corporate reporting' tool (Clarke, 1999),
(4) changes in projects' scope (Clarke, 1999 and Rakos, 1992),
(5) cultural and individual issues (Baba, 1996), and
(6) unavailability of resources (Roman, 1986).

Research Methodology

The primary aims of the study include to explore the current practices and to determine the difficulties encountered during the implementation project planning. The objectives of the investigation include:

- To identify problems encountered during project planning and control in construction projects,
- To determine the positive and negative impacts of project planning and control, and
- To review the factors that influence the effectiveness of project planning and control and the critical success factors in project performance.

The investigation is divided into three (3) types of input to fulfill the research objectives, namely: a literature review, interviews and a questionnaire survey. A literature review was carried out to examine the concept, problem associates and current practice on planning and control. A questionnaire survey was

conducted on construction companies and consultants in West Malaysia.

A total of 500 questionnaire forms were mailed out to 300 contractors and 200 consultant firms. The sample was chosen from the 2003-2004 Construction Industry Development Board (CIDB) Directory of contractors and while the consultants were selected randomly from two main sources namely The Association of Consulting Engineers Malaysia Directory and advertisements in local newspapers.

Out of the 500 questionnaire forms mailed, 20 forms (4%) were returned mainly due to the change in the companies' addresses. A total of 75 completed questionnaires were received representing a 15% response rate. The response rate is low and this low response may be due to the lack understanding of the needed information, lack of interest in the survey or even the lack of awareness on the investigated issue.

Findings and discussion

The findings and discussion of the research conducted are presented in several parts with the following headings:

a) problems encountered during project planning and control,
b) positive and negative impact of project planning and control, and
c) factors influence the effectiveness of project planning and control and factors leading to successful project performance.

Problems encountered during project planning and control

Problems encountered during project planning and control in this research are categorized into three categories, namely:

a) common problems,
b) problems during planning and controlling a construction project time, and
c) problems in planning and control of construction project cost.

Common problems

Table 1.1 shows the common problems encountered during implementing planning and control. From the contractors' perspective, lack of experienced staff is the most critical problem in project planning and control (15.5%) followed by 'unavailability of knowledgeable staff' (14.7%). Planning and controlling a construction project is strongly based on the staff's experience and this will result in a high demand for experienced staff particularly experienced in planning, if planning and control is treated seriously by the construction industry. A relatively long period is required for staff to gain invaluable experience and a member of staff needs to be exposed to a variety of project types to be able to plan and anticipate problems. A new staff has an opportunity to deal only with a simple project. This phenomenon has reduced the chance for the younger and newer staff to be exposed to the variety of works and problems and the available supply of experienced staff cannot meet the high demand of the construction industry and consequently has resulted in the lack of experienced staff in the industry.

In contrast, the consultants identified the two main problems encountered during project planning and control as 'poor coordination' (15.9%) and 'communication problem' (14.3%) as illustrated in the Table 1.2. Poor coordination may occur due to unwillingness to cooperate when there is rivalry or conflict among team members. This condition causes the team members to work against each other to perform. Coordination becomes a more significant problem when there is an individualism culture among the project team. Team members are concerned only with part of the project that is assigned to them. Other parts of the project are ignored to avert them from getting additional work. Coordination and firm follow-up actions by an experienced staff member are required to minimise the interfacing problems.

A consultant's design team often consists of many professionals such as architect, civil engineer, mechanical engineer and electrical engineer. Each of them is an expert in different areas of knowledge. Communication problems may arise from these different back grounds and project goals, if left unattended/guided. This will result in the receiver of the message putting a different interpretation on it from that intended by the sender.

Problems during planning and controlling construction project time

It was observed that the three most significant problems in planning and controlling project time as perceived by the contractors and consultants as shown in Table 1.3 below are 'delay in decision-making' (16.7%), 'change in design and construction method' (15.7%) and 'unforeseen site condition' (15.6%).

Delay in decision-making may be due to poor understanding or lack of knowledge about a particular problem. The process of investigating and understanding the problem will spend some considerable time. In addition, lack of a systematic documentation system in recording the project information can cause failures in passing pertinent information up and down in a project communication structure. This may cause difficulty for a decision maker in gathering essential information and thus causes delay in decision making.

Clients have the tendency to reduce the cost for a construction project during the start, for example, by changing the initial designs and construction methods/ material. After the commencement of the construction work, new needs or even a change of mind from the client or his representative will give rise to **variation orders** that will force the contractor to accept the new designs or construction methods. Hence, more time is required to accommodate these changes in designs and construction methods.

Unforeseen site conditions that unexpectedly arise out of, say, problematic ground condition or obstructions that are not identified before a project starts will ultimately slow down the progress of a project.

Problems in planning and controlling construction project cost

Table 1.4 presents the problems encountered in planning and controlling project cost. "Unexpected market fluctuation" was identified as the most crucial (20.0%). Changes in the global economy have, at times, caused the prices of raw materials to fluctuate unexpectedly. Increases in the price of construction materials such as cement and steel will directly increase the project cost. In addition, shortage of materials would also be the result of excessive demand over supply in the market. This may cause the price of raw materials to fluctuate unpredictably. These situations have made the construction market difficult to predict and contributed to difficulties in estimating the project cost.

'Inaccurate in estimate' was identified as the second critical problem in planning and controlling construction project cost (18.4%). Early cost estimate is done based on the project initial design but changes in design, which often affect the project cost, always occur after the construction has commenced. The lack of experienced staff in estimating will contribute to the unreliable project estimate as there is no standard or specific formula for estimating the project cost. All the estimations are based on the staff's experience and judgment. Inaccuracy in cost estimate always occurs but the extent of inaccuracy must be minimised so as not to disorientate the client.

The impact of project planning and control

Basically there are two categories of impact related in this research namely positive and negative impacts.

Positive impacts of project planning and control

Table 1.5 illustrates that 'project finished within time' (28.8%) is the most vital positive effect on the construction performance followed by 'project completed within budget' (26.6%) and 'achieved client's satisfaction' (16.5%).

Milestones set for each activity during project planning enable project progress to be tracked and corrections made when there is divergence from the initial plan. Suitable measures like acceleration, reallocation of resources or working overtime can be taken to mitigate delay or to get back on track.

Resource scheduling when used in tandem with time planning can be used to reallocate resources to suit projects need. In the same way, cash flow projections help the manager to keep track on project spending and avoid or minimize cost escalation. These tools when used together and the recognition of client's requirements in terms of constraints and expectations from the very early stage of the project aid in timely completion of the project, within its budget and thus satisfying client's needs.

Negative impacts of project planning and control

Table 1.6 shows the negative impacts of project planning and control. Respondents claimed that 'time consuming' (30.2%) as the most negative effect. This is followed in descending order by 'additional staff required' (30.0%) and 'increased cost' (22.2%).

The view that project planning and control is a time consuming and expensive process is supported by the literature. To produce a realistic and workable plan, it is necessary for the management team to gather all information needed from every party involved in a project. This will take some time and even more time, if the documentation system is not systematic. Additional time is required for the data to be transferred to the project management software and for it to produce the plans and control schedules.

There are projects that view that planning and control as an extra task or burden that will need additional skilled staff to be employed. For large or complicated projects, staff skilled in using project management software may be needed to generate the information for project planning and control while experts may have to be employed to oversee the planning and control aspect of the project.

As for the perception that project cost will increase by performing the activities of project planning and control, this can be explained by the additional planning and control staff required and the facilities, such as computers and project management software to support planning and control functions. These "supplementary" functions are considered as additional expenses, thus, 'increased cost' is claimed as the third negative impact for project planning and control.

Factors influencing the effectiveness of project planning and control

Table 1.7 shows the contractors' perspectives on factors that influence the effectiveness of project planning and control. Contractors identified that 'past experience of staff' and 'attitude towards planning and control' are the most influential factors (21.0%). Other factors indicated by the contractors in the descending order of importance include: 'top management support' (19%), 'appropriate choice of planning and control techniques' (17.6%) respectively.

Table 1.8 shows the consultants' perspectives on factors that influence the effectiveness of project planning and control. Factors observed by the consultants in the decreasing influential order are 'past experience of staff' (20.8%), 'attitude towards planning and control' (20.6%), and 'appropriate choice of planning and control techniques' (16.7%). The analysis indicates that the two top ranked factors recognized by both parties are the same, although

the points scored by each factor are different.

Factors Leading to Successful Project Performance

Table 1.9 depicts the factors leading to successful project performance from the contractors' perspective. The contractors view 'excellent teamwork between all parties' (16.8%) as the most important factor that contributes to a successful project. It is followed by 'experience of the project team' (16.4%) and 'good financial condition' (15.2%).

Table 1.10 depicts the factors leading to successful projects from consultants' perspectives. The consultants agreed that 'experience of the project team' is the most important factor that contributes towards a successful project (15.5%) followed by 'excellent teamwork between all parties' (15.3%) and 'realistic and definite set of goals' (13.8%).

Both the contractors and consultants agreed that 'excellent teamwork between all parties' and 'experience of the project team' are the two most important factors that can lead to successful performance. Teamwork is necessary to ensure the good coordination and adequate communication. Through teamwork each person involved in the project is enabled to work towards the same set of project objectives. Teamwork also enhances the relation between team members. Experiences on the effect of poor planning and control gained from other projects would expose project team members on the weaknesses in planning and control current projects. By improving the weakness, the team will become more efficient to handle current and future projects. Experience would increase the awareness on the probable problems in projects and would help each project team to be more confident in overcoming the problems encountered when conducting a project.

Conclusions

Due to the uncertainties in the construction industry, a project is highly unlikely to proceed in its entirety according to the original plan. This phenomenon is further aggravated if problems identified by the consultants, namely poor coordination and communication exist in a project. For the contractors, apparently, the problems to implement a proper project planning are associated with a lack of experienced staff and the cost involved. The industry can be plagued with a mediocre attitude and performance towards planning control if insufficient measures prevail and nothing is done to ensure that poor or non existence of "real" planning and control by the parties. The problems as a result of poor planning and control documentation will continue to exist for the clients, consultants and contractors if planning and control documentations are not updated, recorded and archived. This aspect of planning and control can lead to delays in processing of claims, the project progress and may affect the progress of a project and the relationships between project teams. Clients and consultants must be ready to accept the responsibility and consequences of any poor decisions and bear the consequences of their decisions if the planning and control records showed that they contributed towards project delay and increased cost. Without the responsibility and accountability attitude project planning will always be a cosmetic requirement and serves no real purpose for the project. The end result may affect the professionalism of construction project management.

To overcome the implementation problem that is related to cost, it is recommended that clients should apportion a fixed amount of the project budget for planning and monitoring purposes. Clients must be committed to disburse funds for planning if planning is to have value in the local construction industry. Without serious commitment, planning and monitoring will continue to have a cosmetic

value. Probably, this can overcome the issue of lack of staff that is available for project planning.

The study showed that past experience of staff, attitudes towards planning and control, top management support, appropriate choice of planning and control techniques are essential ingredients towards project planning and control. Once there is a planning and control system, other factors such as teamwork, experience of project team, good financial standing and realistic and definite goals would further determine the success of a project.

Divergences from the plan represent a breach of the agreement and if not countered effectively and in a timely manner the deviations would always result in expanded project duration, more costs and a lower quality. Problems with planning of time are associated with the length of time to decide a particular issue and changes of design and construction method. The problems in cost planning are related to fluctuating of prices and inaccurate estimates. While the former is quite difficult to predict, the latter has to be taken seriously if local companies are to compete globally.

References

Al-Jibouri, Saad H. (2002), *Monitoring systems and their effectiveness for project cost control in construction*, International Journal of Project Management, Volume 21, Issue 2, pp. 145-154.

Ahuja, Hira N., Dozzi, S.P. (1994), *Project Management: Techniques in Planning and Controllin"*, 2nd ed., J. Wiey, New York.

Baba, M. L., Falkenburg, D. R., Hill, D. H. (1996), *Technology Management and American Culture: Implications for Business Process Redesign*, Research-Technology Management, Vol.39, No.6, pp.44–54.

Babcock, Daniel L. (1991), *Managing Engineering and Technology: An Introduction to Management for Engineers*, Prentice Hall, Englewood Clifts, N.J.

Chan, W M., Kumaraswamy Mohan M. (1997), *A Comparative Study of Causes of Time Overruns in Hong Kong Construction Projects*, International Journal of Project Management, Vol.15, No.1, pp. 55-63.

Clarke, Angela. (1999), *A Practical Use of Key Success Factors to Improve the Effectiveness of Project Management*, International Journal of Project Management, Vol. 17, No.3, pp.139-145.

Cohenca, Dora., Laufer, Alexander., Ledbeter, William B. (1985), *Factors Affecting Construction-Planning Efforts*, Journal of Construction Engineering and Management, Vol.115, No.1, pp.70-89.

Cox, J.P. (1993), *The Planning for Success of A Large Project Process At a Large Urban Teaching Hospital*, IEEE Transactions on Professional Communication, Vol. 36, No.1, pp.20-23.

Gould, Frederick E., Joyce, Nancy E. (2002), *Construction Project Management*, Prentice Hall, Upper Saddle River, NJ, 2002.

Hendrickson, Chris., Au, Tung. (2000), *Project Management for Construction: Fundamental Concepts for Owners, Engineers, Architects and Builders*, 2nd ed., Prentice Hall, Inc., Englewood Cliffs, New Jersey.

Hoo, Yeong Chang. (1998), *Project Management for Multistory Building*, Thesis, University of Malaya, Malaysia.

Laufer, Alexander., Cohenca, Dora (1990), *Factors Affecting Construction-Planning Outcomes*, Journal of Construction Engineering and Management, Vol.116, No.1, pp. 135-156.

Lee, F. T. (1998), *Factors in Successful Project Management*, The Monthly Bulletin of The Institution of Engineers Malaysia, Vol.1998, No.8, pp. 35-45.

Malliet, Schone. (2001), *A Primer on the Benefits of Project Intelligence*, http://www.vianovus.com/alt/static/news/cost_sched.html

Mawdesley, Michael., Askew, William., O'Reilly, Michael (1997), *Planning and Controlling Construction Projects: The Best Laid Plans*, Longman, Essex, Harlow.

Oberlender, Garold D. (2000), *Project Management for Engineering and Construction*, 2nd ed., McGraw-Hill, New York.

Payne, Andrew C. Payne., Chelsom, John V., Leavill, Laurie R.P. (1996), *Management for Engineers*, J. Wiley, Chichester.

Rakos, J. (1992), *The Multi Project Problem*, Computing Canada, Vol.18, No.13, p. 22.

Roman, Daniel D. (1986), *Managing Projects: A Systems Approach*, Elsevier, New York.

Spice, Dr. Paul., "International Association of Planning Engineers: A Brief History of Planning Engineering Planning", 2003, www.allpm.com/article.php.

Tan, Andrew A. L. (1996), *Project Management in Malaysia: A Comprehensive Approach for Successful Management of Property Development Projects from Inception until Completion*, Synergy Books International.

Westney, Richard E. (1985), *Managing the Engineering and Construction of Small Projects: Practical Techniques for Planning, Estimating, Project Control, and Computer Applications*, Dekker, New York.

Ranking	Problems	Score (point)	Percentage (%)
1	Lack of experienced staff in this field	94	15.5
2	Unavailability of knowledgeable staff	89	14.7
3	Poor information flow	75	12.4
4	Communication problem	74	12.2
5	Poor coordination	70	11.5
6	Lack of support from top management	63	10.4
7	Lackadaisical attitude	60	9.9
8	Poor financial status	50	8.2
9	Lack of planning and control software	32	5.3
10	Others	0	0
	Total	**607**	**100**

Table 1.1: Contractors' Responses to the Ranking of Problems Faced during Project Planning and Control

Ranking	Problems	Score (point)	Percentage (%)
1	Poor coordination	89	15.9
2	Communication problem	80	14.3
3	Lack of experienced staff in this field	78	14.0
4	Poor information flow	77	13.8
5	Unavailability of knowledgeable staff	75	13.4
6	Lackadaisical attitude	47	8.4
7	Poor financial status	42	7.5
8	Lack of planning and control software	37	6.6
9	Lack of support from top management	35	6.3
10	Others	0	0
	Total	**560**	**100**

Table 1.2 : Consultants' Responses to the Ranking of Problems Faced during Project Planning and Control

Ranking	Problems	Score (point)	Percentage (%)
1	Delay in decision making	210	16.7
2	Change in design and construction methods	198	15.7
3	Unforeseen site condition	197	15.6
4	Unpredictable weather condition	154	12.2
5	Unrealistic contract duration	147	11.7
6	Uncertain labour productivity	128	10.2
7	Communication problem	105	8.3
8	Unavailability of material	101	8.0
9	Others	21	1.7
	Total	**1261**	**100**

Table 1.3 : Problems Faced in Planning and Controlling Project Time

Ranking	Problems	Score (point)	Percentage (%)
1	Unexpected market fluctuation	222	20.0
2	Inaccurate in estimate	205	18.4
3	Extra works required by the client	197	17.7
4	Poor financial condition	177	15.9
5	Extra works caused by the contractor	160	14.4
6	Failure in collection date	130	11.7
7	Others	22	2.0
	Total	**1113**	**100**

Table 1.4 : Problems Faced in Planning and Controlling Project Cost

Ranking	Positive Impacts	Score (point)	Percentage (%)
1	Project finished within time	156	28.8
2	Project completed within budget	144	26.6
3	Achieved client's satisfaction	89	16.5
4	Achieved quality required	83	15.3
5	Improved profitability	66	12.2
6	Others	3	0.6
	Total	**541**	**100**

Table 1.5 : Positive Impacts of Project Planning and Control on Construction Project Performance

Ranking	Negative Impacts	Score (point)	Percentage (%)
1	Time consuming	136	30.2
2	Additional staff required	135	30.0
3	Increased cost	100	22.2
4	Other projects are given less focus	43	9.6
5	Information not useful	32	7.1
6	Others	4	0.9
	Total	**450**	**100**

Table 1.6 : Negative Impacts of Project Planning and Control on Construction Project Performance

Ranking	Factors	Score (point)	Percentage (%)
1	Past experience of staff	121	21.0
1	Attitude towards planning and control	121	21.0
2	Top management support	109	19.0
3	Appropriate choice of planning and control techniques	101	17.6
4	Client's participation	72	12.5
5	Uncertainty of Project	49	8.5
6	Others	2	0.3
	Total	**575**	**100**

Table 1.7: Contractors' Responses to the Factors Influencing the Effectiveness of Project Planning and Control

Ranking	Factors	Score (point)	Percentage (%)
1	Past experience of staff	117	20.8
2	Attitude towards planning and control	116	20.6
3	Appropriate choice of planning and controltechniques	94	16.7
4	Top management support	86	15.3
5	Client's participation	80	14.2
6	Uncertainty of Project	64	11.4
7	Others	6	1.1
	Total	**563**	**100**

Table 1.8 : Consultants' Responses to the Factors Influencing the Effectiveness of Project Planning and Control

Ranking	Factors	Score (point)	Percentage (%)
1	Excellent teamwork between all parties	116	16.8
2	Experience of the project team	113	16.4
3	Good financial condition	105	15.2
4	Planning and control system	79	11.4
4	Realistic and definite set of goal	79	11.4
5	Communication throughout the project	71	10.3
6	Sufficient completion time	49	7.1
7	Client's characteristic	43	6.2
8	Project characteristic/nature	35	5.1
9	Others	0	0
	Total	**690**	**100**

Table 1.9 : Factors Leading to Successful Project Performance – Contractors' Perspective

Ranking	Factors	Score (point)	Percentage (%)
1	Experience of the project team	110	15.5
2	Excellent teamwork between all parties	109	15.3
3	Realistic and definite set of goal	98	13.8
4	Good financial condition	88	12.4
5	Communication throughout the project	86	12.1
6	Planning and control system	80	11.2
7	Sufficient completion time	51	7.2
8	Project characteristic/nature	47	6.6
9	Client's characteristic	41	5.8
10	Others	1	0.1
	Total	**711**	**100**

Table 1.10 : Factors Leading to Successful Project Performance Consultants' Perspective