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Department of Civil Engineering, Indian Institute of Technology Delhi, New Delhi, India

ABSTRACT

Traditionally, construction organizations with a track record of successful project completion were considered successful construction organizations. However, if construction projects were successful, then it is not always necessary for the construction organization to also have been successful. They can even fail and go bankrupt. Therefore, there is a need to think about the success of construction organizations at a corporate level rather than focusing only at the project level. The objective of this study was to identify and to evaluate the successful attributes for construction organizations. The research methodology involved seeking responses from experts in the construction industry through a questionnaire survey. This paper presents the factors that contributed to the success of construction organizations that operate in the National Capital Region of Delhi, India. Factor analysis of responses extracted eight critical success factors: *experience and performance, top management's competence, project factor, supply chain and leadership, availability of resources and information flow, effective cost control measures, favourable market and marketing team, and availability of qualified staff.* The top management's competence emerged as the most critical success factor against various performance factors. The success factors that were identified in this study should provide a guideline to construction organizations for their success.

Introduction

The construction sector is a vital sector for any country that directly or indirectly influences other sectors. This sector contributes significantly to the overall development of the country. According to the 12th five-year plan (2012–2017) set by India's planning commission, the construction industry accounts for about 8% of India's gross domestic product (GDP). In India, the construction industry is the second largest industry after agriculture in terms of providing employment opportunities. During 2011, the construction industry provided direct and indirect employment to about 41 million inhabitants, and it is likely to provide 60 million additional jobs by 2022. The construction industry also provides substantial employment and growth opportunities to other manufacturing sectors like cement, bitumen, iron and steel, chemicals, bricks, paints, tiles, and equipment. The aggregate output of the construction industry, according to the 12th five-year plan, is likely to be US$0.80 trillion (1USD = 65 INR) (Planning Commission of Govt. of India 2013). This sector is one of the most rapidly growing sectors in India. It has shown a compounded annual growth rate (CAGR) of about 11.1% over the last few years. The Indian construction industry accounts for over US$126 billion (Planning Commission of Govt. of India 2013). The level of a country's development is reflected by its infrastructure and India's desperate need for infrastructure development has increased demand of the construction industry.

The recent initiatives taken by the Indian government to develop 100 smart cities under the 'Make in India' programme will provide additional opportunities for the construction sector. The Indian construction sector will remain buoyant due to increased demand from real estate and infrastructure projects. An investment worth US$1 trillion has been projected for the infrastructure sector by 2017, where 40% will be funded by the private sector. Of the total investment, 45% will be invested into construction activities and 20% will be used to modernize the construction industry. Over the next 20 years, approximately US$650 billion will be required for urban infrastructure (Department of Industrial Policy and Promotion, Govt. of India 2017).

Construction organizations are the fundamental units of the construction industry. In the current study, a construction organization is an organization

CONTACT K. K. Tripathi kktripathi05@gmail.com, kamalendra.tripathi@faculty.anangpuria.com

that undertakes a contract to execute a particular type of project, i.e. a contracting company. The client or developer organization is an organization that spends money to develop a project by awarding a contract to the contracting company. The success or failure of the construction industry is highly influenced by the success or failure of construction organizations. As with any other business, success is the ultimate goal of construction businesses, and achieving success is a highly critical issue for these businesses due to tough competition (Arslan and Kivrak 2008). The construction business is considered to be a very risky business. Every year, more and more construction organizations enter into the market only to, after a few years, go bankrupt due to various reasons. However, every construction organization has an opportunity to improve by properly planning the use and allocation of resources, which requires an investment in terms of time and money. It is hard for an organization to decide where and how the resources will be allocated. To accomplish this, the management must think about a specific success factor (SF) that needs to be addressed and how the organization will benefit from these decisions (Abraham 2003). There are many factors that will lead to the success of a construction organization, but due to limited resources, it is very difficult for an organization to concentrate on too many factors at one time (Mbugua et al. 1999). Hence, it is essential to identify critical factors for their success by concentrating on a limited number of factors rather than focusing on too many factors.

The focus of this study is to identify the SFs for construction organizations operating in India. This study utilizes the viewpoints of Indian industry experts to identify and to evaluate the SFs for construction organizations through a questionnaire survey and a structured interview approach. It is evident from the literature that many researchers identified different SFs for construction industries in different countries. However, most of these studies are in the context of construction projects. Very few researchers have drawn attention to identifying the SFs, which can be applied to the construction organizations in India. The authors of this study have tried to identify the factors that will increase the chances of success for construction organizations operating in India, as well as South Asian countries and other developing countries, due to the similarities in their working environments and socioeconomic conditions.

Literature review

Earlier, construction organizations with a good track-record of successful project completions within the time,

cost, and stipulated quality parameters were considered to be successful (Abraham 2003). However, project success does not always ensure the success of the construction organization. The construction organization can even fail or go bankrupt despite the success of its projects due to the high risk involved in the business (Jha 2015). For example, even if the construction project was completed to the satisfaction of its various stakeholders, certain business requisites may not have been fulfilled either financially (through increased profit, turnover, etc.) or strategically (through the market share owned, etc.), and the organization will not be successful. Hence, it is imperative for a construction organization to think about its overall organizational success rather than focusing solely on a project's success (Abraham 2003).

Success is defined as the degree to which the objectives and expectations of an organization are fulfilled, and, in contrast, the failure of an organization stems from its inability to fulfil a commitment when it is due (Arslan and Kivrak 2008). An SF is defined as a condition that needs special attention from management due to the significance it brings to the organization (Hutching and Christofferson 2001). Rockart (1979) defined critical success factors (CSFs) as the few key areas where favourable results are necessary to ensure that management achieves their goal. In these limited areas, 'the things must go right' to make the business successful. Morrison (2009) defined CSFs as those limited factors that are necessary for the success of construction organizations. The organization will fail if the objectives associated with these factors are not accomplished. The organizations need to measure their performance at regular intervals to understand the extent to which the actual performance has deviated from the standards. Usually, key performance indicators (KPIs) are used to measure the performance of construction organizations. In this study, the KPIs are referred to as performance factors (PFs), which includes financial and non-financial measures. PFs help construction organizations to measure their progress towards a stated goal or objective. These help top management to monitor the performance of the organization or a department, at regular intervals, to ensure that the actual performance followed the desired performance (Morrison 2009). According to Kagioglu et al. (2001), performance measurement is the process of determining the extent to which an organization or an individual has been successful in attaining their objectives and strategies. Hence, it helps a construction organization to determine the goal and to optimize its operations.

The aim of the current study is to determine the factors that affect the success of a construction organization. Very few studies are reported in the literature in this area. The researchers have mainly worked on

the factors that affect the success of construction projects, but very few researchers have focused on determining the factors required for the overall success of construction organizations. Hence, a set of factors that could be utilized for the success of construction organizations is lacking. The work done by the researchers in these areas is briefly mentioned below.

Ford et al. (2000) found that the ability of organizations to learn is critical for their success. The dominance of an engineering culture and a lack of organizational learning in infrastructure and development process experiments suggest that organizations with a balance among cultures may be more likely to succeed than those dominated by a single culture. Ofori and Lean (2001) used ranking analysis and factor analysis in their research to identify the factors that influenced the development of contractors in Singapore. Their analysis showed that the growth of these contractors was influenced by the contractor's role, government and institutional assistance, help from practitioners, financial assistance from outside the industry, and by help from clients. Abraham (2003) also conducted a questionnaire-based survey, in addition to using the top 400 contractors identified by the ENR 2000, to determine the factors that led to the success of construction organizations. They suggested that the joint assessment of a project's CSFs, as well as critical organizational SFs, is needed to successfully compete in the construction industry. Later, Flanagan et al. (2007) identified, through their research, the mechanisms that enhance competitiveness at different levels, such as at the project, organizational, and industrial levels, and that will lead to an overall improvement in construction, which could not be accomplished without the combined efforts of all parties, i.e. the project team, organizations, and the industry. In contrast, Cheah et al. (2004) included failure factors, in addition to SFs, while developing a conceptual framework for construction organizations, and found that success is derived from combinations of operational, financial, technological, and human factors rather than from a single condition. They also concluded that a firm may have performed tremendously well in some categories, but it failed because it overlooked one or more critical factors.

Thwala and Phaladi (2009) examined the problems that small and medium-sized contractors face in South Africa's North West province. The major problems faced by small contractors were mainly government policies that did not favour construction businesses, such as the government not paying on time, lacking capital, lacking access to financing, having difficulty in arranging guarantees, lacking a commitment to implement policies that assist small and medium-sized contractors, and having a high interest rate. Furthermore, Jagofa and Wood (2012) utilized the input

and output model designed by Koksal and Arditi (2004) to determine the factors responsible for a business' failure in the construction industry. The study found that the top seven determinants for business failure in the construction industry are as follows: the management's incompetence, insufficient capital, a lack of business knowledge, fraud, industry weaknesses, poor technical and technological capabilities, and poor relations with clients and the government. The literature revealed several other studies across the world that determined the factors leading to the success of construction organizations (see Table 1).

Based on the literature presented in Table 1, it is clear that some researchers have developed various frameworks/models for measuring the success of construction organizations. However, some gaps have been identified in these previous studies. With the help of this study, the authors have tried to fill these gaps. In most of the existing research, researchers have identified the critical factors that lead to the success of construction organizations, but they have not yet drawn attention to the degree of their impact on the individual factors that determine the performance of construction organizations. Most of the researchers have carried out studies that focused on developed countries, like European countries, Australia, and the USA, but very few researchers have carried out research on developing countries, such as on the Indian construction industry. It has been found that the factors responsible for the success of a construction organization in one country may or may not be responsible for the success of a construction organization in another country. As per Lu et al. (2008), IT applications are not considered to be a CSF in the Chinese construction market, whereas, as per El-Mashaleh et al. (2006), IT applications are a very important factor for the success of a construction company in the USA. Some of the research was performed on construction organizations engaged in various sectors, like the power and infrastructure sectors and so on. The factors responsible for the success of construction organizations engaged in one sector may or may not be relevant for the success of a construction organization engaged in another sector. In most of the literature, researchers have only considered contractors in their studies.

Hence, a need was felt to identify those SFs that are vital for construction organizations, but especially those operating in the Indian market and engaged in only the real estate business. In the present study, stakeholders, other than the contractors, such as the client and project management consultants, were also considered. Accordingly, the objectives in the next section were set for this study. The research methods

Table 1. Summary of literature review on success factors of construction organisations.

Researcher's name	Tools used	Country	Attributes/ factors identified	
Butler et al. (2003)	Descriptive statistics	USA	(1) Quality workmanship, (2) good employees, (3) location of the product, (4) customer service,	(5) effective sales and marketing, (6) company reputation, (7) fair pricing and value, and (8) cost control effort.
Skrt and Antoncic (2004)	Hypothesised model	Slovenia	(1) Strategic planning, (2) precise formulation of vision and strategy, (3) incorporation of the elements of internationalisation and networking in the company, (4) accurate analysis of market and competition	(5) correct formulation of generic business strategies focusing on growth, (6) profit, and (7) market.
Gunhan and Arditi (2005)	AHP	USA	(1) Track record, (2) specialist expertise,	(3) project management capability, and (4) international network.
Dikmen et al. (2005)	Artificial neural network (ANN) and multiple regression technique (MR)	Turkey	(1) Ability to benefit from market opportunities, (2) capabilities and culture of an organisation,	(3) joint venturing, and (4) appropriate organisational structure.
Lu et al. (2008)	Descriptive statistics and Factor analysis	China	(1) Project management skills, (2) organisation structure, (3) resources, (4) competitive strategy,	(5) relationships, (6) bidding, (7) marketing, and (8) technology.
Arslan and Kivrak (2008)	Simple multi- attribute rating technique (SMART)	Turkey	(1) Business management factors, (2) financial conditions, and	(3) owner manager characteristics.
Isik et al. (2010)	SEM	Turkey	(1) Resources, (2) strategy,	(3) project management competence, and (4) relationship with other parties.
Abu Bakar et al. (2011)	Relative important index (RII)	Malaysia	(1) Proper management of the organisation, (2) efficient organisational structure, (3) new technology and automation,	(4) customer's satisfaction, (5) market knowledge, and (6) bank loans and other credit facilities.
Tan and Ghazali (2011)	AHP	Malaysia	(1) Contractor's experience, (2) decision-making, (3) contractor's cash flow, (4) project manager's experience, (5) overall managerial actions,	(6) project team experience, (7) project team monitoring, (8) site management and supervision, (9) project delivery system, and, (10) ability to make and carry out decisions.
Peter et al. (2011)	Factor analysis	Ghana	(1) Availability of training proprietors and technicians, (2) ability to delegate responsibility (3) availability of materials and equipment, (4) availability of technology, (5) existence of labour and labour unions, (6) execution of other projects, (7) weather conditions, (8) government policies, (9) competition from other contractors, (10) other professionals,	(11) traders' skills, (12) health and safety consciousness, (13) ability to work as a team and coordinate, (14) client satisfaction, (15) access to finance, (16) interest rate, (17) interim payments, (18) honouring of payment certificates, and (19) communication.

adopted to achieve these objectives are also presented in the following section.

Objectives and research method

The objectives of this study are as follows:

(1) to identify and to evaluate the success attributes for construction organizations,
(2) to determine the SFs for construction organizations and
(3) to determine the CSFs that correspond to various PFs.

To achieve these objectives, a questionnaire survey was conducted, and various statistical analyses were performed. The various steps in the study are described in the following sections.

Identification of success attributes and questionnaire preparation

Taking the lead from the existing literature available on the success attributes for a construction organization, 30 success attributes were identified. While compiling the success attributes, it was noticed that a large number of attributes had been cited for different contexts by different researchers as the reasons for successful construction organizations. To restrict these attributes to a reasonable number, only performance attributes that were cited by at least two researchers were considered. The attributes that were cited by only one researcher were grouped with other

Table 2. List of success attributes and their sources.

Sl. no.	Id	Success attributes	Abraham (2003)	Abu Bakar et al. (2011)	Al-Mahrouq (2010)	Arslan and Kivrak (2008)	Butler et al. (2003)	Chittithaworn et al. (2011)	Gunhan and Arditi (2005)	Dikmen et al. (2005)	Isik et al. (2010)	Jalaliyoon et al. (2012)	Jasra et al. (2011)	Lu et al. (2008)	Mbugua et al. (1999)	Peter et al. (2011)	Raravi et al. (2012)	Shen et al. (2006)	Tan and Ghazali (2011)
1	S1	Availability of qualified staff in the organisation.	✓			✓	✓							✓	✓	✓		✓	✓
2	S2	Availability of cost control measures in the organisation	✓			✓	✓		✓		✓	✓		✓	✓	✓		✓	✓
3	S3	Efficient supply chain management	✓								✓			✓	✓				✓
4	S4	Availability of an effective cash flow management plan	✓			✓									✓	✓			✓
5	S5	Good relationship with local bodies, govt. organisation, etc.					✓			✓	✓			✓	✓			✓	
6	S6	Financial soundness of the organisation				✓	✓	✓	✓	✓	✓		✓	✓	✓			✓	
7	S7	Efficient sales and marketing team in the organisation			✓	✓							✓	✓			✓		
8	S8	Favourable market conditions	✓	✓				✓	✓										✓
9	S9	Favourable external environment						✓											✓
10	S10	Favourable government policies	✓	✓		✓	✓		✓		✓		✓	✓		✓		✓	✓
11	S11	Country's economic conditions				✓								✓		✓			✓
12	S12	Experience in construction business				✓	✓			✓	✓				✓	✓		✓	✓
13	S13	Company's reputation/track record				✓	✓		✓		✓				✓			✓	
14	S14	Client satisfaction in terms of products and services		✓		✓	✓							✓	✓	✓		✓	
15	S15	Customer satisfaction in terms of products and services		✓			✓												
16	S16	Receipt of timely payment of bills		✓		✓								✓	✓	✓	✓		
17	S17	Implementing technological innovation plans		✓		✓	✓				✓								
18	S18	Implementation of health and safety management plan					✓				✓					✓		✓	
19	S19	Developing an appropriate organisational structure	✓	✓	✓					✓	✓			✓				✓	✓
20	S20	Technical competencies of the organisation	✓			✓				✓	✓	✓	✓	✓		✓		✓	✓
21	S21	Effective risk management capability in the organisation				✓			✓		✓			✓	✓			✓	
22	S22	Competitive strategy used by the organisation	✓				✓	✓		✓	✓			✓					
23	S23	Effectiveness of project management		✓		✓	✓		✓		✓			✓		✓		✓	✓
24	S24	Availability of dynamic leadership in the organisation				✓					✓			✓		✓			
25	S25	Effectiveness of human resource (HR) in its functioning								✓	✓	✓		✓	✓		✓		
26	S26	Number of competitors in the market/industry				✓			✓	✓	✓					✓	✓		
27	S27	Proper selection of the project type							✓	✓						✓			
28	S28	Professionalism/culture of the organisation					✓		✓	✓						✓			
29	S29	Availability of equipment, material, and labour								✓				✓		✓		✓	
30	S30	Effectiveness of information flow in the organisation																	✓

Table 3. Extract of the part 1 of questionnaire.

		Very low effect 1	Low effect 2	Moderate effect 3	High effect 4	Very high effect 5
	Please put a tick mark (√) or highlight the relevant cell to rate the following parameters (on 5-point scale from very low effect = 1 to very high effect = 5) with respect to the degree of their effect on the success of the construction organisations.					
Sl. no.	Success attributes					
1	Availability of qualified staff in the organisation.					
2	Availability of cost control measures in the organisation					
3	– – Attributes as given in Table 2					

similar attributes as far as was possible. Following these two sets of rules, 30 success attributes were compiled. Table 2 shows the complete list of success attributes and their sources.

A questionnaire based on the 30 attributes was subsequently designed. A pilot survey was then undertaken to check the wordings and the understanding of the questionnaire, and necessary modifications were made to the questionnaire (Enshassi et al. 2013). The three experts that participated in the pilot survey had more than 30 years of experience in the construction industry (Dikmen et al. 2005). The questionnaire contained three parts: Part 1 contained questions on the organization's success attributes; Part 2 collected information on the respondent's organization, and Part 3 pertained to the respondent's information. An extract of Part 1 of the questionnaire is shown in Table 3.

A 5-point Likert scale was used to measure the degree of the effect of the success attributes on the success of the construction organizations. A 5-point Likert scale was used in this study as it reduced the respondent's frustration level, and thereby increased the response rate compared to the 7-point Likert scale (Buttle 1996). According to the Likert scale, 1 represented a 'very low effect', 2 represented a 'low effect,' 3 represented a 'moderate effect,' 4 represented a 'high effect,' and 5 represented a 'very high effect'.

Sample selection

The selection of construction organizations as the sample used in this study was made from two groups. The first group consisted of members of the Builders Association of India (BAI), and the second group consisted of members of the Confederation of Real Estate Developers Association of India (CREDAI) working in India's National Capital Region (NCR). The BAI members were largely contractors, while the CREDAI members were real-estate developers. Additional members were later included in this study that were neither BAI nor CREDAI members, but that were project management consultants with extensive experience in the construction industry.

Respondents' profile

A total of 106 responses were collected from 90 different organizations. Out of the 106 total responses, 77 responses were collected via personal interviews, and 29 responses were received via email out of the 58 questionnaires that were distributed through this medium. According to Sekaran (2003), a response rate of 50% for questionnaires distributed via email is considered to be a good response rate. Out of the total, 49 (46.23%) responses were from developers, 46 (43.39%) were from contractors, and 11 (10.38%) responses were from project management consultants. Thirteen (12.26%) respondents had less than 10 years of experience, 35 (33.02%) respondents had 10 to 20 years of experience, 50 (47.17%) respondents had 20 to 30 years of experience, and 8 (7.55%) respondents had more than 30 years of experience. Out of 90 total organizations, 39 (43.33%) were developers, 42 (46.667%) were contractors, and 9 (10.00%) were project management consultants. Twenty (22.22%) organizations had less than 10 years of experience, 26 (28.89%) organizations had 10–20 years of experience, 18 (20.00%) organizations had 20 to 30 years of experience, and 26 (28.89%) organizations had more than 30 years of experience. The survey was conducted during the months of May and June 2015.

Analysis method

According to the 5-point Likert scale used in the questionnaire, the success attributes were ranked according to their mean value and their standard deviation, which were obtained for all the responses in the questionnaire survey. If two or more attributes had the same mean value, then the attribute with the lower standard deviation was ranked higher. The mean is calculated by weighing the number of responses recorded for each of the 5-point Likert scale ratings as follows:

$$Mean = \frac{\sum_{i=1}^{n} R_i.F_i}{n} \tag{1}$$

Table 4. Ranking of success attributes.

Sl. no.	Success attributes	Id	Contractor group		Developer group		PMC group		All group	
			Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
1	Availability of resources as per requirement of the project	S29	4.609	1	4.571	1	4.364	5	4.566	1
2	Availability of an effective cash flow management plan	S4	4.326	9	4.510	2	4.636	1	4.443	2
3	Effectiveness of project management	S23	4.435	4	4.429	4	4.455	4	4.434	3
4	Availability of dynamic leadership in the organization	S24	4.457	2	4.327	6	4.636	1	4.415	4
5	Availability of qualified staff in the organization	S1	4.326	8	4.449	3	4.455	3	4.396	5
6	Clients satisfaction in terms of products and services	S14	4.457	3	4.286	7	2.273	6	4.358	6
7	Efficient supply chain management	S3	4.413	5	4.224	10	4.182	10	4.302	7
8	Financial soundness of the organization	S6	4.326	11	4.327	5	4.091	11	4.302	8
9	Customer satisfaction in terms of products and services	S15	4.326	9	4.286	7	2.273	6	4.302	9
10	Receipt of timely payment of bills	S16	4.348	6	4.143	11	4.182	9	4.236	10
11	Availability of cost control measures	S2	4.196	13	4.265	9	4.091	12	4.217	11
12	Company's reputation or track record	S13	4.348	7	4.061	14	4.000	13	4.179	12
13	Technical competencies of the organization	S20	4.217	12	4.000	15	4.273	8	4.123	13
14	Efficient sales and marketing team	S7	3.935	20	4.061	13	3.818	16	3.981	14
15	Effectiveness of human resource (HR)	S25	4.065	15	3.939	17	3.727	21	3.972	15
16	Effectiveness of information flow	S30	4.022	17	3.959	16	3.818	18	3.972	16
17	Good relationship with other parties	S5	3.891	21	4.143	12	3.545	28	3.972	17
18	Professionalism/culture of the organization	S28	4.087	14	3.898	19	3.727	23	3.962	18
19	Proper selection of the project type	S27	4.043	16	3.857	20	4.000	13	3.953	19
20	Developing an appropriate organizational structure	S19	4.935	19	3.816	21	3.818	20	3.868	20
21	Implementation of health and safety management plan	S18	3.826	23	3.939	17	3.636	26	3.858	21
22	Competitive strategy used by the organization	S22	3.957	18	3.796	22	3.636	27	3.849	22
23	Country's economic conditions	S11	3.870	22	3.776	25	3.909	15	3.83	23
24	Experience in construction business	S12	3.783	25	3.776	24	3.818	17	3.783	24
25	Implementing technological innovation plan	S17	3.739	26	3.796	22	3.727	22	3.764	25
26	Favourable government policies	S10	3.783	24	3.735	27	3.636	24	3.745	26
27	Effective risk management capability	S21	3.696	28	3.735	28	3.818	19	3.726	27
28	Favourable market conditions	S8	3.696	27	3.735	26	3.636	24	3.708	28
29	Number of competitors in the market/industry	S26	3.478	30	3.612	29	3.182	30	3.509	29
30	Favourable external environment	S9	3.500	29	3.408	30	3.455	29	3.453	30

Table 5. Spearman's rank correlation test among various groups of respondents on success attributes.

Sl. no.	Comparison of rankings between groups of respondents	Spearman's rank correlation coefficient, R	Significance level, p	Conclusion
1	Contractor ranking vs developer ranking	0.878	0.00	Reject H_0 at $p = 5\%$
2	Contractor ranking vs Project management consultant ranking	0.841	0.00	Reject H_0 at $p = 5\%$
3	Project management consultant vs developer ranking	0.820	0.00	Reject H_0 at $p = 5\%$

H_0 = no significant correlation on the rankings between two groups.

where R_i is the rating using the 5-point Likert scale (1 to 5), F_i is the number of responses received for the rating, and n is the number of responses.

The ranking of the success attributes by various respondent groups and the overall ranking is shown in Table 4.

The Spearman's rank correlation coefficient (SRCC) test was conducted to check the level of agreement between the rankings of any two survey groups on their rankings of the success attributes. The coefficient (R) ranged between −1 and +1. A positive value indicated a positive correlation, 0 indicated no correlation, whereas a negative value indicated a negative correlation between the two groups of ranked variables (Chan et al. 2010). If R is statistically significant at an allowable significance level, say 5%, then the null hypothesis that there is no significant correlation between the two groups on the

rankings can be rejected (Chan et al. 2010). Table 5 shows that there are significant agreements among the various groups on the ranking of the success attributes.

The mean value of the responses obtained from the descriptive statistical analysis was not a whole number as mentioned in the questionnaire; the various effects of the attributes on the success of construction organizations may lie, for interpretation purposes, between mid-points of two adjacent scales

Table 6. Categories of attributes

Sl. no.	Mean value (μ)	Degree of effect	Attributes
1	$\mu \geq 4.5$	Very high	S1
2	$4.5 > \mu \geq 3.5$	High	S2–S8, S10–S25, S27–S30
3	$3.5 > \mu \geq 2.5$	Moderate	S9, S26
4	$2.5 > \mu \geq 1.5$	Low	Nil
5	$1.5 > \mu$	Very low	Nil

Table 7. Result of one-sample *t*-test.

One-sample test				
			Test value = 3.5	
Success attributes	Id	*t*	df	Sig. (two-tailed)
Availability of qualified staff	S1	14.702	105	.000
Availability of cost control measures	S2	9.040	105	.000
Efficient supply chain management	S3	11.694	105	.000
Effective cash flow management plan	S4	14.342	105	.000
Good relationship	S5	5.400	105	.000
Financial soundness	S6	11.476	105	.000
Efficient sales and marketing team	S7	6.347	105	.000
Favourable market conditions	S8	2.582	105	.011
Favourable external environment	S9	−0.474	105	.637
Favourable government policies	S10	2.821	105	.006
Country's economic conditions	S11	3.872	105	.000
Past experience	S12	3.147	105	.002
Company's reputation/track record	S13	8.353	105	.000
Client's satisfaction	S14	12.514	105	.000
Customer satisfaction	S15	11.076	105	.000
Receipt of timely payment	S16	10.653	105	.000
Technological innovation plans	S17	3.133	105	.002
Health and safety management plan	S18	3.529	105	.001
Appropriate organizational structure	S19	4.570	105	.000
Technical competencies	S20	8.825	105	.000
Effective risk management capability	S21	2.560	105	.012
Competitive strategy	S22	3.981	105	.000
Effectiveness of project management	S23	14.848	105	.000
Availability of dynamic leadership	S24	15.315	105	.000
Effectiveness human resource	S25	6.596	105	.000
Number of competitors	S26	0.108	105	.914
Selection of the project type	S27	5.129	105	.000
Professionalism/culture	S28	5.600	105	.000
Availability of equipment, materials and labours	S29	17.346	105	.000
Effectiveness of information flow	S30	6.176	105	.000

(Jha and Iyer 2007). The attributes can be categorized based on their mean values as shown in Table 6.

Only the success attributes with a mean value 3.5 (high effect) or higher were considered for further analysis. At a certain mean value, the statistical significance of the attributes can be checked using either a parametric one-sample *t*-test or a non-parametric one-sample Sign test and a one-sample Wilcoxon test. Although the data were normally distributed and free from outliers, the present study utilized the parametric one-sample *t*-test to check the statistical significance of the attributes possessing a mean value of 3.5. This test determined whether the sample mean was statistically different from the population mean (Ofori et al. 2000). The results of the one-sample *t*-test are given in Table 7. As can be seen from Table 7 that the two attributes, favourable external environment (S9) and number of competitors (S26), had a significance level of >0.05, and thus they did not pass the one-sample *t*-test with a test value of 3.5. This indicates that these success attributes did not have a significant effect on the success of construction organizations. Incidentally, it can also be seen from

Table 4 that these two attributes occupy the last two ranks based on their mean values. Thus, out of the 30 attributes, only 28 attributes (see Tables 6 and 7) showed 'very high' and 'high' effects on the success of construction organizations.

An organization interested in becoming successful in the construction business would find it quite difficult to utilize all the 28 success attributes mentioned above. Thus, in the present study, factor analysis is performed on all 28 success attributes to identify the underlying factors that explain the pattern of correlations within a set of observed attributes. This method is often used by many researchers in data reduction to identify a small number of factors that explain most of the observed variance in a much larger number of observed attributes. Factor analysis was performed for the responses of all respondents using SPSS 21 (for Windows). The principal components method of extraction was used along with varimax rotation, which maximizes the variance of the squared loading for each factor that produced a clear factor loading (Cho et al. 2009). The principal components method of extraction begins by finding a linear combination of a component that accounts for as much variation in the original attributes as possible. It then finds another component that accounts for as much of the remaining variation as possible and that is uncorrelated with the previous component; it continues in this way until there are as many components as there are original attributes (Newing 2011). Usually, a few components will account for most of the variance, and these components can be used to replace the original attributes. In the present analysis, only attributes with a factor loading of >0.5 were considered as the sample size was 106 (Leung et al. 2004). The output of the factor analysis showed that the Bartlett test of Sphericity was 378 and the associated significance level was 0.000, which indicated that the correlation matrix was not an identity matrix (Doloi 2009). The Kaiser Meyer Olkin (KMO) value was 0.794 (>0.5), which showed that the sample is adequate for conducting factor analysis (Field 2009). The subject to variable ratio (STV) was 3.78 (106/28), which also supports the sample adequacy of the data as its value was more than the minimum requirement of 2 (Kline 1979). Based on the factor loading of the rotated component matrix obtained by varimax rotation, eight success components, called SFs, with an eigenvalue greater than one were extracted, and accounted for 62.922% of the total variance. The results of the factor analysis of the success attributes are shown in Figure 1 and they are explained in the section titled SFs.
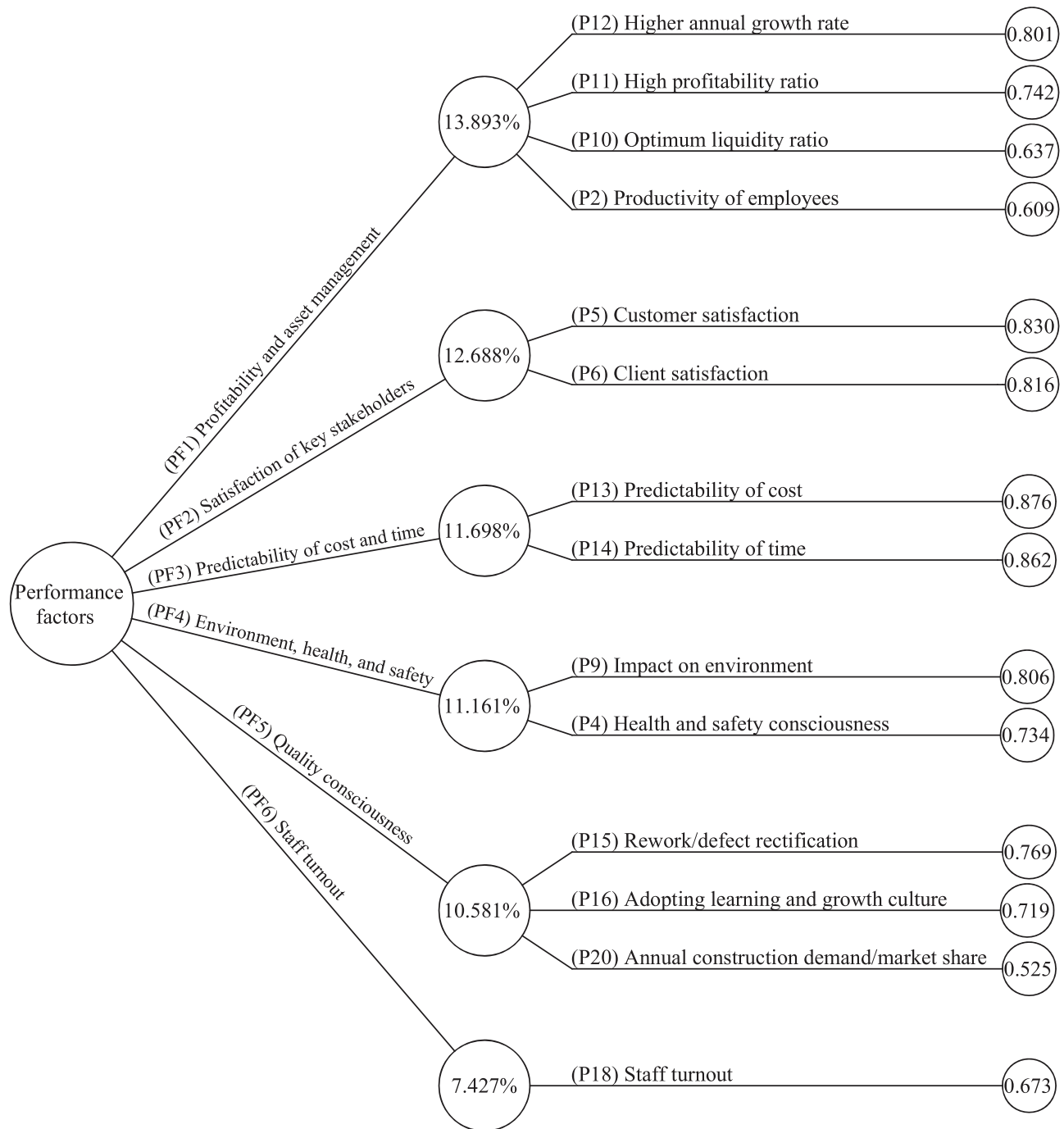
Figure 1. Success factors.

Figure 2. Performance factors.

To check the applicability of the factor analysis, a reliability test, which is a measure of the internal consistency, was performed. The internal consistency of the attributes is explained by the reliability coefficient, which is based on the average correlation between the attributes and the number of total attributes in the sample. To test the internal consistency, Cronbach's alpha ($C\alpha$) test was performed on all the attributes with a 'very high' and a 'high' effect as given in

Table 6. The value of $C\alpha$ varied from 0 to 1. A higher value of $C\alpha$ indicates a greater internal consistency or greater inter-criteria correlations and vice versa. As a rule of thumb, a $C\alpha > 0.7$ is acceptable (Pongpeng and Liston 2003; Doloi 2009). In this analysis, the value of $C\alpha$ was 0.873, which indicated a good overall internal consistency of the attributes.

To check whether the attributes grouped together under a factor in the factor analysis collectively

Table 8. Stepwise regression results.

Performance factors (dependent)	Success factors (independent)	Unstandardized coefficient		T-value	Standardized β coefficient	Sig. (p)	R²/adjusted R²
		B	Std. error				
Profitability and asset management (PF1)	Constant	0.016	0.085	0.183		0.855	0.273/0.258
	Top management competence (SF2)	0.485	0.086	5.642	0.483	0.000	Durbin–Watson = 1.874
	Project factor (SF3)	0.199	0.086	2.320	0.199	0.022	
Satisfaction of key stakeholders (PF2)	Constant	−0.010	0.085	−0.116		0.908	0.296/0.259
	Experience and performance (SF1)	0.315	0.085	3.685	0.316	0.000	Durbin–Watson = 1.945
	Supply chain and leadership (SF4)	0.280	0.086	3.276	0.281	0.001	
	Top management competence (SF2)	−0.226	0.086	−2.631	−0.225	0.010	
	Project factor (SF3)	0.183	0.086	2.127	0.182	0.036	
	Effective cost control measures (SF6)	0.175	0.087	2.005	0.172	0.048	
Predictability of time and cost (PF3)	Constant	−0.001	0.093	−0.009		0.993	0.124/0.115
	Experience and performance (SF1)	0.351	0.093	3.765	0.352	0.000	Durbin–Watson = 1.874
Environment, health, and safety (EHS) (PF4)	Constant	0.002	0.088	0.022		0.982	0.243/0.219
	Experience and performance (SF1)	0.384	0.088	4.381	0.385	0.000	Durbin–Watson = 1.874
	Top management competence (SF2)	0.236	0.088	2.683	0.236	0.009	
	Effective cost control measures (SF6)	0.209	0.089	2.341	0.206	0.021	
Quality consciousness (PF5)	Constant	−0.005	0.092	−0.057		0.955	0.171/0.145
	Top management competence (SF2)	0.273	0.093	2.948	0.272	0.004	Durbin–Watson = 1.874
	Availability of information flow and resources (SF5)	0.272	0.094	2.887	0.266	0.005	
	Favourable market and marketing team (SF7)	0.186	0.092	2.012	0.185	0.047	

explains the same measure, the Pearson bivariate correlation (r) test was performed, which explains the amount by which two variables are correlated. The attributes under each factor, SF1 to SF8, were positively correlated in the range of 0.196–0.661.

The factor analysis grouped like variables under various factors that depended upon the level of correlation among them. However, it does not indicate the criticality of these factors. To achieve the third objective, another survey was performed for the determination of factors, which measures the performance of construction organizations. For this, a total of 20 attributes related to performance measurement were collected from the literature. The scale used in the questionnaire were similar to the one described earlier in this paper. The factor analysis was performed on the responses for this question in the same way as discussed in this paper. The factor analysis extracted six organizational PFs. The results of the factor analysis of the performance attributes are shown in Figure 2. The details of the performance attributes and the PFs for construction organizations are available in Tripathi and Jha (2018).

To find the criticality of SFs that correspond to various PFs, a stepwise regression was performed. The regression analysis results were used to develop prediction models and to assess the order of importance for each of the factors. Factor scores for all the success and PFs were calculated during the factor analysis, and then regression was carried out. The PFs (denoted as PF1 to PF6) were taken as dependent variables one at a time, and the SFs (denoted as SF1 to SF8) were taken as independent variables all together. The regression results are summarized in Table 8.

Success attributes of construction organizations

The most important success attribute was the availability of equipment, material, and labour as per the project requirements, which had the highest mean value of 4.566 (see Table 4). These are the primary strengths of construction organizations. If an organization is not able to provide the equipment, material and labour required for a project, then it will not be successful in the construction business.

The second most important success attribute was the availability of an effective cash flow management plan in the organization, which had a mean value of 4.443. Maintaining a positive cash flow was a critically important matter for all the construction organizations. A construction organization must maintain a cash balance that is sufficient to meet labour payrolls, material payments, to pay equipment hire charges, to meet emergencies, and to satisfy other financial obligations. If these requirements are not fulfilled, sometimes construction organizations have no other choice but to close the business. This attribute is followed by the effectiveness of project management in improving the schedule, cost, and the quality of the construction project, the availability of dynamic leadership in the organization, and the availability of qualified staff in the organization, which had respective mean values of 4.434, 4.415 and 4.396.

The function of project management includes activities such as planning, cost control, quality control, risk management, and safety management. The construction organization must have an efficient project management team to achieve project goals. As the project is at the core of the construction industry, project management's competence cannot be dissociated from the overall success of the construction organization.

According to Isik et al. (2010), leadership involves the development and communication of the mission, vision, and the values to the members of an organization. Successful leadership in the organization is expected to create an environment for innovation, empowerment, learning, and for support. According to many researchers, the effectiveness of a leader is a major determinant in the success or failure of an organization or even the success of the country as a whole.

The availability of qualified staff in the organization is probably the most important resource in a competitive environment and it is also a key to the organization's success. An organization's capabilities, in terms of qualified staff, are an important factor in the assessment of potential bidders in the international construction business (Gunhan and Arditi 2005).

Client satisfaction, in terms of products and services, is one of the important attributes for any business to be successful. No business could run for a long time if the client was not retained. The client can be retained by understanding and fulfilling their requirements for satisfaction. In construction, the client satisfaction is determined by conformance to specifications and completion of the project within the planned costs and timeframe. Other factors that affect client satisfaction are the quality of the products, the response to complaints and so on.

Supply chain management has a strong correlation with project success. The supply chain is a network of different parties, processes, and activities that produce products or services. All stakeholders, such as the owner, consultants, contractors, subcontractors, and suppliers, constitute the supply chain in the construction industry. An improved performance could be achieved by increasing the quality of communication among the various stakeholders involved in the construction business.

The financial soundness of an organization, in terms of better liquidity and working capital, is highly essential for a construction organization to continue their business. The stronger the organization's financial position, the better is its capability to carry out its strategic plans. The company would be able to take higher risks for larger returns. Such companies enjoy a better reputation and reliability among their clients and suppliers.

Many clients measure the performance of the constructed property to understand how well the project's delivery systems have satisfied their requirements. The business usually tracks the satisfaction of their customer by using a survey to obtain customer feedback, their concerns, and a customer-provided rating of the business.

To maintain a positive cash flow and to repay short-term liabilities, such as labour payments, material payments, and other financial liabilities, timely payments of bills are critical. Sometimes, construction organizations stop work due to non-payments of bills, which causes a dispute between contractors and the client and ultimately delays the project. It has also been found that a construction organization had to close their business due to the simultaneous non-payment of bills for several projects.

Success factors for construction organizations

In the previous sections, a brief discussion was presented on some of the most significant success attributes. This section explains the eight SFs that were extracted using the factor analysis.

Experience and performance (SF1)

Experience is highly related to a company's knowledge management competency. Learning in the

organization can be effective only when the lessons learned in the past are utilized in future (Isik et al. 2010). Comparing the performance of the organizations with their competitors is important. Like any other market-oriented industry, construction organizations should also depict an image that fits the needs of their clients. The satisfaction of clients and customers, in terms of products and services, is also an important attribute that affects the construction business in terms of repeat business from the client. Relationships with customers, material suppliers, subcontractors, and so on are also very important, and they can help the organization to arrange and manage additional sources of finance in the form of credit arrangements. All the attributes under this factor are largely relevant to experience and the performance of the organization, and hence, the name of this section. This factor explained 15.771% of the total variance.

Top management's competence (SF2)

The attributes under this factor consist of an effective risk management capability in the organization, professionalism/culture in the organization, the selection of the project type, and the financial soundness of the organization in terms of better liquidity and working capital. These attributes are directly governed by the top management; hence, the name of this section. Most of the organizations expected a higher profit margin on riskier projects. Therefore, organizations should develop a risk management plan that increases the probability of success by focusing the project management's attention on the high-risk factors identified during the risk assessment. Professionalism/culture in the organization should be such that every individual enjoys working in the organization, and has the freedom to express his/her thoughts and ideas. An appropriate culture enhances the dedication of employees, and hence, plays an important role in the success of the organization. Financial soundness indicates the strength of the organization in the market in terms of its capability to execute projects. As the financial strength of an organization increases, its credibility and reputation also increase among their clients and suppliers. This factor explained 8.730% of the total variance. This finding is supported by the studies of Cheah et al. (2004) and Dikmen et al. (2005).

Project factor (SF3)

The attributes under this factor consist of the availability of an effective cash flow management plan, the

effectiveness of project management at improving the schedule, cost, and the quality of the construction project, and the receipt of timely payment of bills as stated per contractual provisions. These attributes support the success of the project, and hence, the name Project Factor for this heading. An effective cash flow management plan and the receipt of timely payment of bills are highly essential for organizations to continue their businesses smoothly. As projects are the core of the construction business, project management's competence cannot be dissociated from the overall performance of an organization. Effective project management ensures better schedules, costs, and quality performances for the project. This factor explained 7.125% of the total variance.

Supply chain and leadership (SF4)

Both attributes under this factor, an efficient supply chain management and the availability of dynamic leadership in the organization, have high factor loadings, and hence, it was decided to name this factor using a combination of these two attributes. Efficient supply chain management means that the supply chain management team should supply the right materials in the right quantity, at the right time, and at the right price. Dynamic leadership involves developing and communicating the mission, vision, and the values to the members of an organization. Successful leadership is expected to create an environment for empowerment, innovation, learning, and for support (Isik et al. 2010). This factor explained 6.904% of the total variance. This factor was also found to be significant in the study by Lu et al. (2008).

Availability of resources and information flow (SF5)

The attributes under this factor consist of the effectiveness of the information flow system in the organization and the availability of equipment, materials, and labour as required by the project. The construction business is highly affected by its information flow system. Therefore, the effectiveness of the information flow system in an organization is very important for the success of the construction organization, because it keeps the organization updated about new projects and price information regarding labour, materials, and equipment. It also provides updates on the price and the range of services offered by the organization so that it can compete in the market. If

all the resources, like the equipment, the material, and the labour, are available as required by the project, then it is more likely that the project will be successful if handled properly. This factor explained 6.766% of the total variance. This finding is supported by the study by Dikmen et al. (2005), which draws attention towards the importance of resources as a driver of organizational success.

Effective cost control measures (SF6)

Efficient cost control measures in an organization ensure that the lowest possible overall project cost is achieved, and it keeps the owner's investment objectives in view. The attributes under this factor are the availability of cost control measures in the organization and favourable government policies. Although the first attribute had a high factor loading, the name 'effective cost control measures' was chosen for this section. Although the second attribute had a low factor loading, it also indirectly contributed to the overall cost of the organization, and hence, it was wise to retain this attribute under this factor. This factor explained 6.515% of the total variance. In the study by Butler et al. (2003), cost control measures were placed among the top five factors for the success of construction organizations.

Favourable market and marketing team (SF7)

The attributes under this factor are favourable market conditions and an efficient marketing team in the organization. Both attributes under this factor are highly important for the success of construction organizations. To run a construction business smoothly, the market in which the organization operates should be favourable in terms of the number of competitors, the intensity of the competitiveness, the market's growth rate and so on. For any construction organization, analysis of the market in which it operates or has an interest in developing its position is very important. Developing a sales and marketing plan is critical to the success of a construction organization. Sales and marketing do not mean only selling or advertising a product; it is the strategic plan developed for the organization that looks at the organization's strengths and weaknesses and the areas in which the organization has a competitive advantage. Every organization should have a dedicated department to analyse the market in which it operates (Abraham 2003). This factor explained 6.268% of the total variance.

Availability of qualified staff (SF8)

The only attribute under this factor is the availability of qualified staff in the organization, and hence, the name of this section. This factor mainly focused on the appointment of qualified staff in the organization, which is considered to be a key to success. This factor can directly affect the schedule, cost, and the quality of construction to a large extent. A company's technical competency is measured by analysing the company's construction methods, its experience, and the productivity of their staff, the speed of its activities, and the quality of the products. This factor explained 4.844% of the total variance.

Critical success factors for construction organizations

It can be clearly seen from Table 8 that the SFs – top management's competence (SF2) and the project factor (SF3) – are critical for the PF 'profitability and asset management (PF1)', which includes attributes like higher annual growth rate, higher profitability ratio, optimum liquidity ratio, and productivity of the employees. The higher beta value for top management's competence ($\beta = 0.483$), compared to the project factor's value ($\beta = 0.199$), shows that top management's competence had a greater impact on the 'profitability and asset management' of the organization compared to the 'project factor'.

The SFs – experience and performance (SF1), supply chain and leadership (SF4), top management's competence (SF2), project factor (SF3), and effective cost control measures (SF6) – were critical for the PF 'satisfaction of key stakeholders (PF2).' The higher beta value ($\beta = 0.316$) for experience and performance (SF1) showed that this factor had a greater impact on the 'satisfaction of key stakeholders-(PF2)'. The negative beta value ($\beta = -0.226$) for 'top management's competence (SF2)' indicated that, if the top management focuses more on profitability due to a poor financial condition, then an inappropriate project selection or a highly risky project may be undertaken, which will adversely affect the satisfaction of key stakeholders. This finding is in line with that of Leung et al. (2004).

The SF – 'experience and performance' (SF1) – was critical for the PF 'predictability of the cost and time'. This means that the predictability of cost and time could be improved by improving the attributes under the factor 'experience and performance' (SF1).

Figure 3. Critical success factors.

The SFs – experience and performance (SF1), top management's competence (SF2), and an effective cost control measures (SF6) – were critical for the PF 'environment, health, and safety (PF4) '. The impact of the SF for experience and performance (SF1) had a larger impact ($\beta = 0.385$) than the other two factors because its beta value was the largest among them.

The SFs – top management's competence (SF2), the availability of resources and information flow (SF5), and a favourable market and marketing team (SF7) – were critical for the PF 'quality consciousness (PF5) '. The higher beta values for SFs SF2 ($\beta = 0.272$) and SF5 ($\beta = 0.266$) showed that their impacts were larger than that for SF SF7 ($\beta = 0.185$).

None of these SFs were found to be critical for the PF pertaining to staff turnover (PF6).

The regression results presented above are summarized in Figure 3. The SFs are listed on the horizontal axis, while the PFs are listed on the vertical axis. The tick marks indicate the presence of a statistically significant relationship between the performance and SFs. The blank space indicates the absence of a statistically significant relationship between the performance and SFs. From Figure 3, it is clear that the SF top management competencies (SF2) affected

as many as four PFs: profitability and asset management (PF1), satisfaction of key stakeholders (PF2), environment, health, and safety (PF4), and quality consciousness (PF5); hence, it can be considered as the most CSF for the overall success of construction organizations. This finding is also in line with that by Abu Bakar et al. (2011), who highlighted the importance of top management competencies within any given organization in profoundly affecting the success or failure of that organization. The second most CSF was experience and performance (SF1), which affected three PFs: satisfaction of key stakeholders (PF2), predictability of cost and time (PF3), and environment, health and safety (PF4).

Discussion

This study was conducted to identify the factors that affect the success of construction organizations. From the review of literature, 30 attributes that affect the success of an organization were identified. Only 28 attributes were found to have 'very high' and 'high' effects based on the t-test, and were selected for a factor analysis. The analysis of the questionnaire survey

and the resulting success attributes revealed some important findings.

The findings obtained from the ranking analysis used simple statistics to indicate the following top 10 significant success attributes: (1) availability of equipment, material, and labour as per requirement of the project, (2) availability of an effective cash flow management plan, (3) effectiveness of project management in improving the schedule, cost, and the quality of the construction project, (4) availability of dynamic leadership in the organization, (5) availability of qualified staff in the organization, (6) client satisfaction in terms of products and services, (7) efficient supply chain management, (8) financial soundness of the organization in terms of better liquidity and working capital, (9) customer satisfaction in terms of products and services and (10) receipt of timely payment of bills as stated per contractual provisions.

While comparing the findings of this study to those of the other studies conducted across the world, it was found that some of the top 10 attributes for India were also found to be significant in countries like China, Malaysia, and Turkey. These attributes are as follows: availability of resources as per requirement of the project (Isik et al. 2010), availability of an effective cash flow management plan (Tan and Ghazali 2011), effective project management (Gunhan and Arditi 2005; Isik et al. 2010), availability of dynamic leadership (Isik et al. 2010), efficient supply chain management (Lu et al. 2008), financial soundness of the organization (Dikmen et al. 2005; Arslan and Kivrak 2008) and customer satisfaction (Butler et al. 2003; Abu Bakar et al. 2011).

However, availability of qualified staff, client satisfaction, and receipt of timely payment of bills were not found to be significant in these countries, while these attributes were placed in the top 10 attributes for India. Incidentally, the attributes – favourable market conditions in which the organization operates, the number of competitors in the market/industry, and a favourable external environment (political, social, administrative, etc.) – placed in the last three positions were also not found to be significant in these countries. The factor analysis was performed to reduce a large number of success parameters into a manageable number, which enabled the extraction of the eight SFs that have been discussed under the heading SFs.

These factors could be utilized as a basic guideline for the top management at Indian construction organizations that are willing to develop further and to grow. Most of the clients, while selecting the construction organization, would like to have these parameters fulfilled by the contractors to reduce the risk of time overruns, budget overruns, low quality work, a large number of claims and litigation, suffering from workforce scarcity, and a lack of supervision. If the construction organizations improved their performance by meeting these criteria, then they are most likely to obtain more and more business even in a competitive market. Construction organizations that achieve success and growth will ultimately contribute to the growth of the nation.

Conclusions

Like any other business, achieving success is the goal of construction businesses. A large number of factors influence the success of construction businesses. It is not possible for any of the organizations to simultaneously concentrate on a large number of factors due to their limited resources. Hence, it is imperative to identify limited factors that disproportionately influence the success of construction organizations (Mbugua et al. 1999). This study attempted to find a set of factors that influence the success of construction organizations engaged in the real estate business. A questionnaire survey approach was adopted for this study. It was evident from the discussion that the findings of this study justify the statement that the factors responsible for the success of construction organizations in one country may or may not be responsible for the success of construction organizations in another country.

The factor analysis of the responses to success attributes enabled the extraction of the following eight SFs: *experience and performance*, *top management's competence*, *project factor*, *supply chain and leadership*, *availability of resources and information flow*, *effective cost control measures*, *favourable market and marketing team*, *and availability of qualified staff*. It is suggested that improvements in these areas by construction organizations will increase the chances for their success in the construction business.

Stepwise regression of the success and PFs resulted in CSFs for individual PFs. Top management's competence was found to be the most CSF for the overall success of construction organizations. Mackey (2008) found that the executive leaders and the top management teams are critical to the success of an organization. The top management team significantly influences the outcomes of the organization as they determine the strategic plan, instil values, formulate a common purpose, and influence the culture of the

organization. Furthermore, proper management of the organization was found to be the most significant factor for the success of construction companies in Malaysia in the study carried out by Abu Bakar et al. (2011). The above two studies support the findings of the current study.

It should be noted that, in the present study, the SFs have been identified by focusing on organizations engaged only in real estate business; the perception of construction organizations involved in other areas may vary. Hence, the findings of this study may further be replicated by focusing on different groups of construction organizations (e.g. highway projects, railway projects, and airport projects). For a construction organization operating in another sector, different sets of success attributes and SFs would have to be identified based on their needs. Subsequently, a comparative study could be performed for the SFs for construction organizations engaged in real estate business with that of the focused group of construction organizations operating in India, as well as in other developing countries, which may prove to be a useful research topic.

Limitations

As the construction industry is very complex, the scope of this study was limited to construction organizations executing only real estate projects and operating in India's NCR. However, the construction organizations operating in India's NCR also operate across the country. The result of this study should apply to the entire country, South Asian countries, and other developing countries because the success of construction organizations engaged in real estate business have similarities in their working environments and other socioeconomic conditions.

Disclosure statement

No potential conflict of interest was reported by the authors.

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