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ORIGINAL CONTRIBUTION

A Review Paper on Identification of Critical Success Factors (CSFs) for Successful Project Management of Construction Projects

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Abstract— The study was conducted to write a review paper on the identification of most important factors in order of importance after reviewing various studies on the subject. These factors can serve as a guideline while undertaking any project related to the construction industry. Moreover, various aspects of the project have also been explored regarding key traits of Project Team, Project stakeholders, and Project management practices. These highlighted areas can play an important role in the successful project management of any project related to the construction industry. There are many factors that need to be considered during the course project planning, project execution/implementation, and finishing of the projects. These factors play vital role for on-time completion of the construction Project. Out of the numerous factors involved, there are some critical factors which are compulsory to be considered for the success of the construction project. In writing of this review paper, 10 research papers were studied, and 44 factors involved in the construction industry were verified. Upon studying further, only 10 critical factors were finalized, which occurred numerously in the different papers, were considered, and are presented in the table. These 10 critical factors are the ones that decide the fate and success of any construction project. Since it was found that they were repeated in multiple research papers, it shows the importance and significance of the factor in any construction project, which is to be considered. Various review papers are available for software projects but comprehensive review related to construction-related projects and specifically guiding factors concerning project management has not been identified recently. The study will help companies consider the most important factor prior to initiating any project related to construction.

Index Terms— CFs, Construction Professionals, Project Objectives, AHP.

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Introduction

Project success analyses and critical factors for performance are widely used to enhance project quality and effectiveness. According to Saqib et al. (2008), the idea of project success was often elusive to the minds of industry professionals. For the first time in project management, Rockert used the phrase "critical success factors," referring to certain factors that can predict project success (Saqib et al., 2008). Rockart et al. (1982) terms success factors as "those few areas of activity in which desired results are essential for a manager to reach his/her goals." Technique of the success factor is a process which aims to define the key areas where management needs to concentrate its efforts to achieve pre-determined objectives.

Success factors were defined by Rockart et al. (1982) as "those few areas of activity in which favorable results are necessary for a manager to reach his/her goals." The methodology of CSFs is a process that tried to determine the important areas that management requires to improve their efforts to achieve pre-determined objectives. Alinaitwe & Ayesiga (2013) labeled the term "success factor" as essential factors that have to be maintained for teamwork to take action in an effective and efficient way. To achieve and maintain successful objectives and targets in a business, critical success factors is a vital aspect of it. Hardcastle et al. (2005) explains CSF as a practice that attempts to open areas which states managerial success. This process was in use in the 70's to measure the management and more importantly, in the area of financial, manufacturing systems and information industry.

Focusing on he factors that dictate the success of a project is a method to study the project's success. Multiple models and lists related to CSF were proposed in the literature over the last few decades. Rockart et al. (1982) was the first person to introduce the concept of CSFs where he stated it as “the limited number of areas in which results if they are satisfactory, will ensure successful competitive performance for the organization.” Garbharran et al. (2012) says that in any project management system, CSFs are those variables that increase the chances of a project’s success. The study of factors that affects the success of the project and the criteria that measure it has attracted a huge amount of researchers. In the success of a project, the project leader plays the most vital role, which has been proved by multiple studies in the literature (Hwang & Ng, 2013; Yang & Maxwell, 2011). It is the responsibility of the project leader to come up with an effective strategy for the project, which can increase the likelihood of success of the project. Ahmad & Cuenca (2013)

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says "Project Leader must possess essential leadership and managerial knowledge, skills, competencies, and characteristics which ensure successful projects completion by taking right decisions at the right time and involving right people at right places". Successful projects are a result of well-integrated teams. In construction projects, for team integration, he pointed out 15 key practice indicators. In the success of any project, the significance of effective relationship management was pointed out by Meng (2012). In the construction business, effective planning and management is the key to the project's success. CSF in project management was also well studied by Ribeiro et al. (2013). It also impacts the success of the project via knowledge management practice, which was studied by Yang & Maxwell (2011). The relationship between the team and its size also had a mild effect on the success of the project. For construction sites, Ismail et al. (2014) stated the most influencing safety factors that administered the success of a system of safety management. The survey resulted in determining the most influencing factor of safety, i.e., personal safety. It was followed by communication.

Aksorn & Hadikusumo (2008) determined 16 CSFs of the safety programs. The most influencing factor was "Management's support". One of the factors that governs the success of a project is the safety program's implementation. They determined 7 most CSF which are: "(1) management support; (2) clear and reasonable objectives; (3) personal attitude; (4) teamwork; (5) effective enforcement; (6) safety training; and (7) suitable supervision".

For public housing projects, the study suggested that the top 3 factors that contribute to schedule performance are "site management," "coordination among various parties," and "availability of laborers on-site." Cost performance is the basic criteria for measuring the success of any project. Multiple resource-related factors significantly determine the cost of construction. According to Gohar et al. (2012), "analyzing critical causes of failure and success in construction projects is a useful method in identifying risk factors."

Tools, materials, planning, construction technology, rework, supervision system, condition of job site, and weather were the most critical factors that governed the sub-contractor's productivity (Hardcastle et al., 2005). Tan & Ghazali (2011) stated 40 CSFs for contractors and also stated 7 main categories, which are "(1) project management factors; (2) procurement related factors; (3) client-related factors; (4) design team-related factors; (5) contractor related factors; (6) project manager-related factors; and (7) business and work environment-related factors". Hwang & Ng (2013) stated that the success of a project has a significant influence by the construction contractor. Hence, it is essential to choose a contractor who is qualified and capable enough in construction management.

The objective of this study is to list down the most important factors in descending order of importance after reviewing various studies on the subject. These factors will extend great guidelines when undertaking any project pertaining to the construction industry. Moreover, various aspect of the project has also been explored with respect to key traits of Project Team, Project stakeholders, and Project management practices. These highlighted areas, if considered can play important role in the successful project management of any project related to construction industry. The research question was to write down a review paper on identification of CSFs for the successful Project management of construction projects.

Construction Projects

Construction projects can be classified into three types, which are industrial, civil, or heavy and building construction projects. The same team can do not all projects. Each project requires a dedicated team that can plan, design, construct, and carry out the construction work. In the construction industry, the smallest and most important part is industrial construction Typically, the industrial construction owners for such projects are industrial corporations and for-profit organizations in various fields such as generation, manufacturing, chemical, medicine, petroleum, etc. In an already existing property, the process of adding some structure can be classified as a building construction projects. Commonly, these types of projects involve minor changes in the structure like the addition of a room or renovation of already existing rooms or toilets. In such cases, the project manager is the owner of that property. Regardless of the type of construction project, they all share certain elements such as legal and design considerations, financials, etc. One example of building construction is residential projects.

Review of Literature

To write a review paper, we gathered information from the last 10 years articles published from 2011 to 2020 with the subject "identification of critical success factor for construction projects". Gudienė et al. (2013) carried out research that can identify CSFs in construction projects at Lithuania. CSFs were ranked by the Analytic Hierarchy Process (AHP) tool for construction projects there. Fig 1 shows the research methodology.

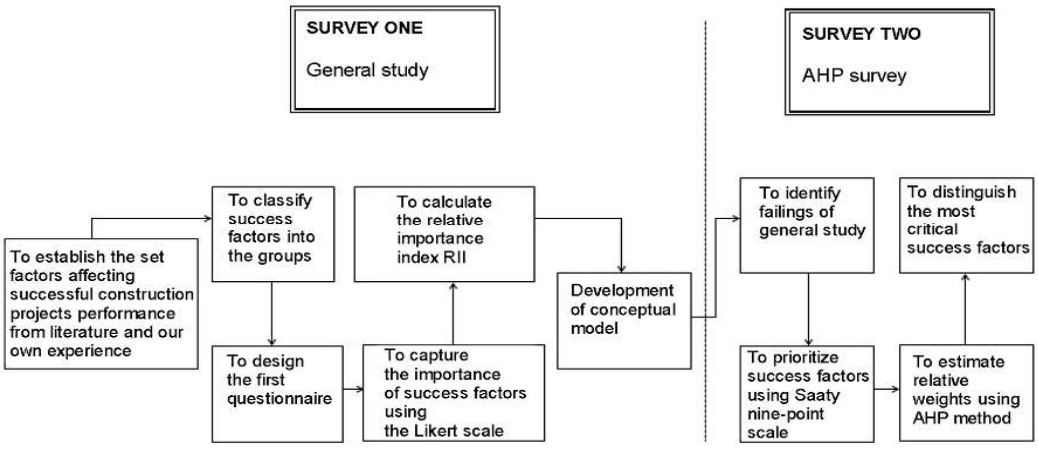
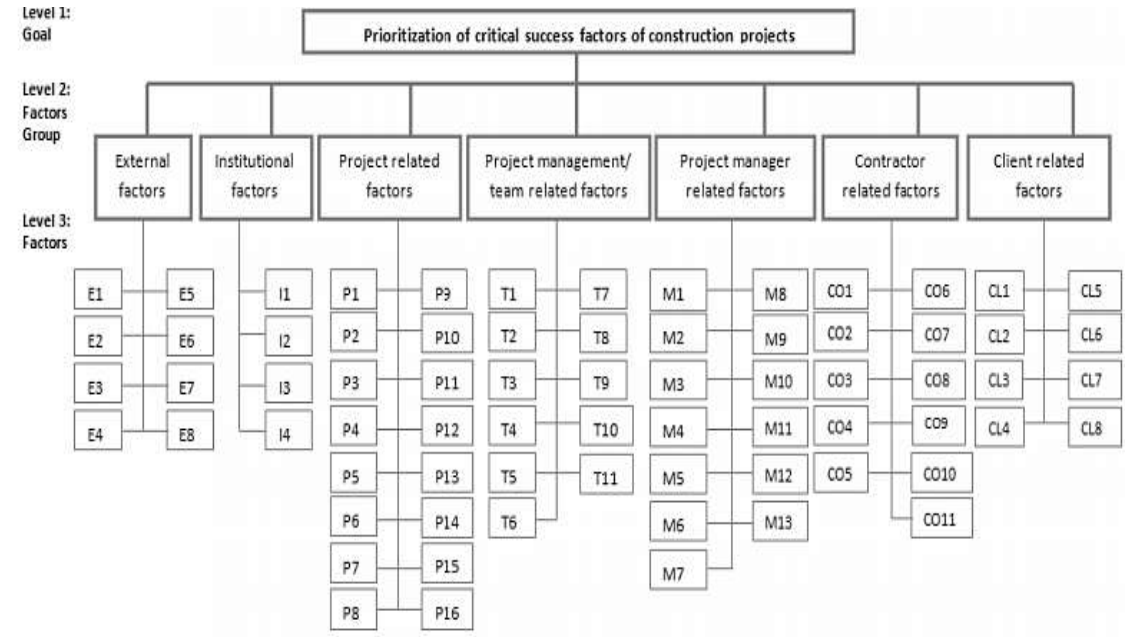


Fig. 1. *The research methodology for Gudienė et al. (2014)*

This study is comprised of both AHP survey and a generic survey. Seventy-one (71) project success factors were established by the author and his team on the basis of literature review. Those factors were then further categorized into 7 main elements, which are contractor related, client-related, manager related, management/ team related, project-related, institutional related, and external factors. Twenty-seven (27) construction experts and professionals with great experience and knowledge were requested to rank the proposed success factors in the general survey. The survey used a 5 points scale. Those scores were then converted to important factors to establish the related score of proposed success factors. The rank of CSFs and Relative Importance Index (RII) calculation results are found in Gudienė et al. (2013).

A detailed assessment system that contains 9 points is used to further enhance and refine the results in the AHP. This technique was also mathematically verified by Saaty & Vargas (1980). In many constructions related studies, AHP has been proved to be successful because it helps make decisions that have multi-criteria problems (Alias et al., 2014; Amade et al., 2015; Gohar et al., 2012; Irma & Baihaqi, 2018; Tan & Ghazali, 2011).

In AHP, the first thing is to form a hierarchical structure that sets a goal that is pre-determined and defines possible factors that support each group factor. Figure-2 demonstrates the suggested structures which evaluate and prioritize the CSFs. The identified CSFs are then further classified into 7 groups; the hierarchical structure of those factors is provided. Subsequently, they have applied AHP approach and assigned the local and global weights based on the mathematical calculation presented in this paper. Table III shows the ranking of CSFs based on the local and global ranking.



E1 Economic Environment
E2 Technological Environment
E3 Physical Environment
E4 Nature Ecological Environment
E5 Social Environment
E6 Legal Environment
E7 Political Environment
E8 Cultural Environment
I1 Construction regulations
I2 Construction Permits
I3 Product and service certifications
I4 Standards
P1 Values
P2 Size
P3 Clear & Realistic Goals
P4 Project Type
P5 Procurement
P6 Complexity and uniqueness
P7 Realistic schedule, urgency
P8 Planning
P9 Innovations
P10 Materials & Equipment
P11 Supervision
P12 Construction Methods
P13 Accidents
P14 Profitability
P15 Risks
P16 Adequate Funds / Resources
T1 Relevant past Experience
T2 Competence
T3 Trouble shooting
T4 Decision Making Effectiveness
T5 Control System
T6 Motivation
T7 Project Organization Structure
T8 Good Communication
T9 Risk identification and allocation
T10 Technical Capability
T11 Personal issue
M1 Competence
M2 Experience
M3 Technical Capability
M4 Leadership skill
M5 Motivating Skill
M6 Organizing skill
M7 Coordinating skill
M8 Effective and timely conflict resolution
M9 Adaptability to changes, management of changes
M10 Delegation authority and responsibility
M11 Perception of role and responsibility
M12 Trust
M13 Contract management Company characteristic
CO1 Technical and professional capability
CO2 Experience
CO3 Economic and financial situation
CO4 Owner's Management capability
CO5 Top Management Support
CO6 Quality Issues
CO6 Health and safety condition
CO7 Work Conditions
CO8 Advance Technologies
CO9 Extent of Subcontracting
CO10 Experience
CO11 Type (Private vs. Public)
CL1 Size
CL2 Influence
CL3 Ability to make timely decision
CL4 Clear and precise goals/ objectives
CL5 Risk Attitude
CL6 Ability to participate in different phases of projects

Fig. 2. *The hierarchy model of the CSFs*

This study revealed top 10 CSFs for construction project undertaken at Lithuania is tabulated in Table II.

Table I
Top 10 highest ranked CSFs

S. No.	Highest Rank Factors
1.	clear and realistic project goals
2.	project planning
3.	project manager's competence
4.	relevant past experience of the project management/team
5.	the competence of the project management/team
6.	clear and precise goals/objectives of the client
7.	the value of the project
8.	the complexity and uniqueness of the project
9.	the project manager's experience
10.	the client's ability to make timely decisions

Kog & Loh (2012) conducted research to find out the CSFs for various civil construction projects. CSFs have been specified in this study for various construction project components, e.g. architectural works, civil and structural (C&S) engineering works, and mechanical and electrical (M&E) engineering works.

This work is an extension of work under Chua et al. (1999). In this review, the expert examined consists of 15 C&S engineers, five M&E engineers, six architects and seven quantity surveyors.

The purpose of this study is to distinguish the various CSFs for the particular project goals of schedule, budget, quality and overall results for architectural works, C&S engineering works, and M&E engineering works as viewed by various construction work professionals. In order to determine the relative significance of success-related factors, the AHP is introduced to follow unbiased informed expert opinion.

A quality review of the 33 questionnaires completed showed that the average accuracy ratio of six questionnaires was found to be well above 0.1 (Saaty & Vargas, 1980). This high degree of inconsistency requires further review of those six respondents' views. Hence, an additional accuracy test was carried out. The correspondence between the respondents within each subgroup is determined to verify that the views of that subgroup converge. Since the survey seeks to classify the CSFs based on experienced practitioners' inputs, it is important to investigate whether the few less experienced respondents have closely associated views of what constitutes CSFs for construction projects compared with those with more experience. The method used is the Kendall sampling distribution method, which is approximated for more than seven variables by the chi-squared distribution. The chi-squared values represent the correlation of the 67 success-related variables within a given subgroup sharing the same collection of years of experience between the respondents' rankings. The study found that the chi-squared values for the subgroup consisting of respondents with 10 to 15 years of experience as well as those of respondents with less than 10 years of experience were lower than the critical value at a 95 per cent confidence scale for all project goals. This suggests there is no consistent indication that the three respondents' rankings of the success-related variables are strongly associated within either of the two subgroups. This indicates that might not be sufficient enough to judge these six respondents.

Table II
Success-related factors the research addresses

Project aspect	Success-related factor
Project characteristics	(1) Political risks, (2) economic risks, (3) impact on public, (4) technical approval authorities, (5) adequacy of funding, (6) site limitation and location, (7) constructability, (8) pioneering status, (9) project size
Contractual arrangement	(10) Realistic obligations/clear objectives, (11) risk identification and allocation, (12) adequacy of plans and specifications, (13) formal dispute resolution process, (14) contractual motivation/incentives
Project participants	(15) PM competency, (16) PM authority, (17) PM commitment and involvement, (18) capability of client key personnel, (19) competency of client proposed team, (20) client team turnover rate, (21) client top management support, (22) client track record, (23) client level of service, (24) capability of contractor key personnel, (25) competency of contractor proposed team, (26) contractor team turnover rate, (27) contractor top management support, (28) contractor track record, (29) contractor level of service, (30) capability of consultant key personnel, (31) competency of consultant proposed team, (32) consultant team turnover rate, (33) consultant top management support, (34) consultant track record, (35) consultant level of service, (36) capability of subcontractors key personnel, (37) competency of subcontractor's proposed team, (38) subcontractor team turnover rate, (39) subcontractor top management support, (40) subcontractor track record, (41) subcontractor level of service, (42) capability of supplier's key personnel, (43) competency of supplier's proposed team, (44) supplier team turnover rate, (45) supplier top management support, (46) supplier track record, (47) supplier level of service
Interactive processes	(48) Formal design communication, (49) informal design communication, (50) formal construction communication, (51) informal construction communication, (52) functional plan, (53) design complete at construction start, (54) constructability program, (55) level of modularization, (56) level of automation, (57) level of skilled labor required, (58) report updates, (59) budget updates, (60) schedule updates, (61) design control meetings, (62) construction control meetings, (63) site inspections, (64) work organization chart, (65) common goal, (66) motivational factor, (67) relationships

Source: The table has been adopted from the study of Adnan et al. (2015)

Subsequently, The Top 10 CSF rankings for the various civil-construction project components are summarized as Table IV.

Table III
Overall project performance ranking of CSFs

	C&S engineers	M&E engineers	Quantity surveyors	Architects	Professions that have ranked this factor within top 10 CSFs
Constructability	1	3	1	9	C&S, M&E, QS, Arch
Adequacy of plans and specifications	2	1	2	1	C&S, M&E, QS, Arch
Project manager competency	3	2	5	2	C&S, M&E, QS, Arch
Realistic obligations	4	4	4	4	C&S, M&E, QS, Arch
Project manager commitment and involvement	7	7	3	6	C&S, M&E, QS, Arch
Contractual motivation/incentives	8	5	9	12	C&S, M&E, QS
Adequacy of funding	22	8	10	5	M&E, QS, Arch
Economic risks	5	18	7	14	C&S, QS
Construction control meeting	6	10	16	28	C&S, M&E
Technical approval authorities	10	9	21	24	C&S, M&E
Project manager authority	16	25	6	7	QS, Arch
Pioneering status	9	22	13	13	C&S
Project size	28	6	14	29	M&E
Site limitation and location	11	12	8	23	QS
Client top management support	14	40	20	3	Arch
Contractor key personnel capability	29	20	38	8	Arch
Contractor team competency	32	26	23	10	Arch

Source: The table has been adopted from the study of Adnan et al. (2015)

The study shows that adequacy of team leaders' plans and specifications and competence are two of the success-related factors listed among the top 10 CSFs in terms of schedule, quality, budget, and overall performance for architectural, C&S, and construction project engineering works.

The findings of this study revealed that the human factors are crucial in achieving project success for architectural works, particularly the quality of the consultant and the contractor.

Amade et al. (2015) examined the findings of a survey designed to determine crucial success factors for the civil-construction of public sector projects in Owerri, Imo state of Nigeria. Data on the study variables were obtained using standardized questionnaires from fifty-six (56) construction companies based in Owerri, Imo State using the Krejcie and Morgan sampling method. The accuracy of the system was assessed using different statistical methods, such as reliability testing using Kaiser-Meyer-Olkin (KMO) sampling accuracy calculation and Barlett sphericity search, while factor analysis and linear multiple regression were used in data analysis and inference using SPSS software. The exploratory factor analysis emphasizes a small collection of six (6) success factors after factor analysis of sixteen (16) primary variables.

Table IV
List of 6 CSFs for Owerri, Imo state of Nigeria

S. No.	CSFs
1.	Efficient and efficient mechanism / Method of procurement
2.	Managing communication efficiently
3.	Sufficient planning
4.	Project manager's leadership qualities
5.	Climate conditions
6.	Effective project co-ordination

Pakseresht & Asgari (2012) determined key success features in civil-construction projects. The aim of this study is to identify and rank the critical success factors in Pars Garma Company's construction projects. His research was planned and conducted in two stages to determine those factors. At the first level to classic the crucial success factors, a questionnaire was prepared and distributed among 58 people from Pars Garma ompany staff managers, project managers and technical experts. Using Z-test and SPSS 16 tools, data collected from the distributed questionnaires were then analysed. In the second point, by omitting low-effect variables, a questionnaire was built based on AHP method to gather expert opinions and distributed among 15 organizational expert persons. Expert Choice software analyzed the returned questionnaires.

These seven factors were listed by Ashley as success factors in 1986:

1. Programmable building tasks
2. Project planning
3. Engagement of project manager with the priorities
4. Motivation for project team
5. Technical skills of project manager
6. Monitor Panels
7. Job description and its relevant sector

He also identified theses six criteria as the success criteria:

1. Budget performance
2. Schedule performance
3. Employer satisfaction
4. Task-orientation
5. Contractor satisfaction
6. Project manager satisfaction

Later in 1996 Walid Belassi and Tukel Oya Icmeli split the crucial performance factors in a modern format into four main groups:

1. Factors depending on project
2. Factors depending on team members and the project manager
3. Dependent elements in structure of organization
4. Factors which rely on the external environment

In addition to studying the contracting concept of civil-constructing projects and library materials, interviews were conducted with project managers to satisfy standard specifications. They eventually selected seven criteria:

1. Effective factors in project management
2. Employer related factors
3. Project logistics related factors
4. Consultant design team related factors
5. Contractor related factors
6. Project manager related factors
7. Environmental factors related to the project's business environment

This work is informative in terms of application and analytical realistic. The tools by which data are obtained are two questionnaires. The first questionnaire includes questions on the scale of 32 Likert styles which identify the critical success factors. The second questionnaire, distributed among individual researchers after the first, was in the form of an AHP questionnaire, and was designed to calculate the parameters and indexes associated with the critical success factors.

Based on this calculation following top ten factors were identified.

Table V
Top 10 Key performance factors for building projects of Pars Garma Company

S.No.5	Critical Factors	% Weight
1	Economic and Technical evaluation of the project needed resources	14.5
2	Project management experience and management record	10.2
3	Strategic planning of Project	8.8
4	The executive perspective of contractor on the project subject	6.5
5	Capacity of on-time decision-making (project client agent)	6.3
6	Managing project control	6.1
7	Prioritizing the purchase of the products needed according to the project schedule	5
8	Mechanism to form an experienced technical-legal team at contract time	4.6
9	Authorization in Economic decision taking and cost management considering the form and scale of the project	3.7
10	Financial payment process in respect of project obligations and schedule	2.9

Research Methodology

This research consists of literature review, drawing conceptual model, analysis of selected success features, and discussion of outcomes & finally the deductions. The literature review is focused on top critical success factors were gathered from different researches for construction project. Then a comparison table was formulated in which top success factors from different researches were listed. So, total 44 CSFs were tabulated and categorized into 05 categories namely, team factors, organizational factors, factors for the project, factors for project management and environmental factors. Later the top-10 most important CSFs are listed for construction projects based on their incidence of success factors in the literature under review.

Analysis of Success Factors

The essential approach of success measure was employed through businesses and functions. Total 44 CSFs were tabulated and categorized into 05 categories namely, team factors, organizational factors, factors for the project, factors for project management and environmental factors. Subsequently, factors are numbered based on its occurrence. Subsequently, it would become easier to choose top success factors out of this list.

Table VI
Categorization and ranking of key success features

CSF Category	Key Success Features	No. of occurrence in Literature
Team Factors	Project manager's competence Project manager's competency Project manager's leadership traits Project manager's authority Project manager's commitment and involvement of	6
	Project management experience and management record of team lead The project manager's experience	2
	Project management/team related past experience Project management/team proficiency	2
	Proficiency of contractor key personnel Capability of contractor's team The executive perspective of contractor on the project subject	3
	The capacity of the client to make decisions in due time Capacity of on-time decision-making (project client agent)	2
Organization Factors	Clear and specific customer targets / objectives	1
	Project value Project size	2
	Constructability	1
	Technical approval authorities	1
	Authorisation in Economic decision taking and cost management considering the form and scale of the project	1
	Client top management support	1
	Financial payment process in respect of project obligations and schedule	1
	Incentives/motivation of contract	1
	Sufficient funding for the Project	1
	Economic Threats	1
	The complexity and uniqueness of the project	1
	Pioneering status	1
	Technical approval authorities	1
Project Factors	Adequacy of plans and specifications project planning Adequate planning Project strategic planning	4
	Realistic obligations	1
	clear and realistic project goals	1
Project Management Factors	Efficient and effective procurement process/method Prioritizing the purchase of the required resources according to the project schedule	2
	Managing communication efficiently Effective project co-ordination	2
	Construction control meeting Project control management	2
	Mechanism to form an experienced technical-legal team at contract time	1
	Prioritizing the purchase of the products needed according to the project schedule	1
Environmental Factors	Climate conditions	1
	Site limitation and location	1

Final CSFs for Manufacturing Projects

Based on the no. of occurrence of various factors in different study under consideration, following top 10 factors have been identified. These critical success features can play vital role in the success of any civil-construction project.

Table VII
Categorization and ranking of key success features

S. No.	10 Critical Success Factors	No. of Occurrence
1.	Competence of Project manager's	6
2.	Adequacy of plans and specifications	4
3.	Proficiency of contractor team	3
4.	Project management experience and management record of team lead	2
5.	Project management/team related past experience	2
6.	The capacity of the client to make decisions in due time	2
7.	Project value or size	2
8.	Efficient and effective procurement process/method	2
9.	Managing communication efficiently	2
10.	Project control management	2

Discussion

This study pertains to a writing review paper on the identification of critical success factors for the successful project management of construction projects.

In, the first phase, literature review was conducted. During this phase, more than 40 different studies were considered, which might have any linkage to formulate success criteria for the construction Project. However, 30 studies were not used as they do not have any direct relationship with the construction Project or construction industry. Therefore, 10 research papers were thoroughly reviewed for formulating a conceptual model for the identification of as many success factors as we can identify for the construction industry. In this manner, 44 success criteria were identified and tabulated. Subsequently, categorized into 05 categories, namely, team factors, organizational factors, factors for the project, factors for project management, and environmental factors. Then factors are numbered based on its occurrence in various studies. After doing this exercise, it is easier for us to choose the top success factors out of this list. Top-10 most important CSFs are listed for construction projects based on their incidence in the literature under review.

The most important factor that came out for the success of any project is the competence of the Project Manager. It is a quite evident fact that competent leadership matters a lot, and it can create a huge difference in on-time completion projects with required objectives. A second success criterion is the adequacy of the plan and specifications relevant to the project. Planning is again a very important aspect of the project, and if the plan and specifications have been worked out thoroughly, there are tremendous chances that the project will succeed. A third important criterion is the proficiency of subcontractor team. It is a fact that if you have hired a skillful sub-contractor for undertaking a construction project with a lot of experience, then there are chances that your project remains successful. The remaining 7 factors are also very important for the attainment of project-related goals for the construction industry.

In this review paper, we have identified10 most important success criteria, if considered definitely pave the way for successful completion of project meeting timeline, objectives, and cost.

Limitations and Future Research Directions

The limitation of this study is that various studies considered for this review paper are not directly related to South Asian region. This might slightly affect the outcome while using the above-mentioned success criteria while undertaking any south Asian region or Pakistan project.

However, as a future direction, we can study the various on-going constructions project in South Asian regions. We can identify critical success factors, specifically considering the geopolitical situation of this region or for Pakistan.

Conclusion

It can be concluded that after a review of 10 research paper, 44 success factors were considered and thoroughly evaluated. During the review process, it was seen that some of the factors are repeating again and again in these studies. It was seen that the numerous repetition of that factor in multiple papers were a sign that they have a critical role in the successful project management of civil construction projects. These 10 factors are to be taken into serious consideration in relation to success factors for these projects. In this way, 10 most critical factors of success were picked out of the 44 factors found in research papers under study. It has also been confirmed that the project manager having a degree of competence is the most important criterion of the critical factor of success as it was repeated in 6 different papers. However, the importance of remaining factors cannot be denied while undertaking any civil construction project.

References

Adnan, H., N. M. Yusw and, F. Y., & Bachik, F. (2015). Critical success factors for contractors. *IJEIR*, *2*(2).

Ahmad, M. M., & Cuenca, R. P. (2013). Critical success factors for ERP implementation in SMEs. *Robotics and Computer-Integrated Manufacturing*, *29*(3), 104-111.

Aksorn, T., & Hadikusumo, B. H. (2008). Critical success factors influencing safety program performance in Thai construction projects. *Safety Science*, *46*(4), 709-727. doi:https://doi.org/10.1016/j.ssci.2007.06.006

Alias, Z., Zawawi, E., Yusof, K., & Aris, N. (2014). Determining critical success factors of project management practice: A conceptual framework. *Procedia - Social and Behavioral Sciences*, *153*, 61-69. doi:https://doi.org/10.1016/j.sbspro.2014.10.041

Alinaitwe, H., & Ayesiga, R. (2013). Success factors for the implementation of public-private partnerships in the construction industry in Uganda. *Journal of Construction in Developing Countries*, *18*(2), 23-28.

Amade, B., Ubani, E. C., Omajeh, E. O.-M., & Njoku, U. (2015). Critical success factors for public sector construction project delivery: A case of Owerri, Imo State. *International Journal of Research in Management, Science and Technology*, *3*(1), 11-21.

Chua, D. K. H., Kog, Y.-C., & Loh, P. K. (1999). Critical success factors for different project objectives. *Journal of construction engineering and management*, *125*(3), 142-150. doi:https://doi.org/10.1061/(ASCE)0733-9364(1999)125:3(142)

Garbharran, H., Govender, J., & Msani, T. (2012). Critical success factors influencing project success in the construction industry. *Acta structilia*, *19*(2), 90-108.

Gohar, A. S., Khanzadi, M., & Farmani, M. (2012). Identifying and evaluating risks of construction projects in fuzzy environment: A case study in Iranian construction industry. *Indian Journal of Science and Technology*, *5*(11), 3593-3602.

Gudienė, N., Banaitis, A., & Banaitienė, N. (2013). Evaluation of critical success factors for construction projects: An empirical study in Lithuania. *International Journal of Strategic Property Management*, *17*(1), 21-31. doi:https://doi.org/10.3846/1648715X.2013.787128

Gudienė, N., Banaitis, A., Podvezko, V., & Banaitienė, N. (2014). Identification and evaluation of the critical success factors for construction projects in Lithuania: AHP approach. *Journal of Civil Engineering and Management*, *20*(3), 350-359.

Hardcastle, C., Edwards, P., Akintoye, A., & Li, B. (2005). Critical success factors for PPP/PFI projects in the UK construction industry: A factor analysis approach. *Construction Management and Economics*, *23*(5), 459-471.

Hwang, B.-G., & Ng, W. J. (2013). Project management knowledge and skills for green construction: Overcoming challenges. *International Journal of Project Management*, *31*(2), 272-284.

Irma, B., & Baihaqi, I. (2018). The integration of AHP and QFD for contractors selection. *Journal of Advances in Technology and Engineering Research*, *4*(3). doi:https://doi.org/10.20474/jater-4.3.3

Ismail, D., Majid, T. A., Roosli, R., & Ab Samah, N. (2014). Project management success for post-disaster reconstruction projects: International NGOs perspectives. *Procedia Economics and Finance*, *18*, 120-127.

Kog, Y. C., & Loh, P. K. (2012). Critical success factors for different components of construction projects. *Journal of Construction Engineering and Management*, *138*(4), 520-528. doi:https://doi.org/10.1061/(asce)co.1943-7862.0000464

Meng, X. (2012). The effect of relationship management on project performance in construction. *International Journal of Project Management*, *30*(2), 188-198.

Pakseresht, A., & Asgari, G. (2012). Determining the critical success factors in construction projects: AHP approach. *Interdisciplinary Journal of Contemporary Research in Business*, *4*(8), 383-393.

Ribeiro, P., Paiva, A., Varajão, J., & Dominguez, C. (2013). Success evaluation factors in construction project management—some evidence from medium and large Portuguese companies. *KSCE Journal of Civil Engineering*, *17*(4), 603-609. doi:https://doi.org/10.1007/s12205-013-0019-4

Rockart, J. F., Ball, L., & Bullen, C. V. (1982). Future role of the information systems executive. *MIS Quarterly*, *6*, 1-14. doi:https://doi.org/10.2307/248989

Saaty, T. L., & Vargas, L. G. (1980). Hierarchical analysis of behavior in competition: Prediction in chess. *Behavioral Science*, *25*(3), 180-191.

Saqib, M., Farooqui, R. U., & Lodi, S. H. (2008). Assessment of critical success factors for construction projects in pakistan. In *First International Conference on Construction In Developing Countries (ICCIDC-I),* Karachi, Pakistan.

Tan, D. J., & Ghazali, F. M. (2011). Critical success factors for Malaysian contractors in international construction projects using analytical hierarchy process. In *International Conference on Engineering, Project, and Production Management,* Singapore (p. 20-21).

Yang, T.-M., & Maxwell, T. A. (2011). Information-sharing in public organizations: A literature review of interpersonal, intra-organizational and inter-organizational success factors. *Government Information Quarterly*, *28*(2), 164-175.