An Analysis of Factors for Increase in Financial Turnover Gap Between Construction Companies Established During Same Time Period in KSA

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ABSTRACT

This research investigates and evaluates various management-related factors influencing the Saudi Arabian construction companies that are responsible for the increase in the financial turnover gap between construction companies established during the same time period in KSA and tries to determine if the corporate management team or the site management team has a significant effect on the overall performance and success of construction companies. The study has made use of quantitative research methods with a deduction approach. This research is conducted by using a web-based survey questionnaire targeted at the sample size of 400 professionals from all regions of Saudi Arabia including all demographic levels. As per the results, the highest RII scorings of the success/failure factors related to the corporate management (Payment delay, Poor cost estimation, Weakness of the financial and technical capabilities of some contractors, and Delays in decision making by the management team) revealed the importance of corporate management issues that are responsible for the increase in financial turnover gap. The results obtained from the research would provide insight to companies for better identification of issues that may be facing the organization and therefore, helpful in the formation of policies that may benefit the organization to reduce the financial turnover gap between them. This is the first research that covers all five major grading areas: Roads, Water and sanitation work, Buildings, Electrical work, and Mechanical work with grade I, II & III classified contractors including all thirteen provinces of Saudi Arabia. The literature review revealed that none of the previous research covered all the above grading areas and demography.

Keywords: Construction Companies, Corporate Management, Financial Performance, Site Management, Success/Failure Factors.

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I. INTRODUCTION

A. Background to Research

During the last few decades, the Kingdom of Saudi Arabia (KSA) has experienced rapid growth in development due to its investment of multi-billion dollars in the Oil & Gas sector as well as due to its need for developing the country's infrastructure. This led to a huge increment in construction projects (Sarhan *et al.,* 2017), resulting in the establishment and growth of numerous construction companies in the KSA. There has been a boom in the Saudi Arabian construction industry from the period of 1975 to 1983 and from 2007 to 2008 due to increased revenues generated from oil and gas industries (Assaf *et al.,* 2010). The KSA's construction industry is further expected to grow as residential, commercial, and governmental demands rise in the future; this is due to the annual population increase and the industry will also expand due to the expected implementation of the National Industrial Clusters Program and the development of economic cities (Bahidrah & Korkmaz, 2017). According to Alsaedi *et al.* (2019) In Saudi Arabia, it is mandatory for each contractor to obtain a classification certificate. The Saudi Arabian contractor classification system is classified into five grade levels and within 29 fields. According to the Ministry of Municipal and Rural Affairs (MMRA), the contractors' classification is an indicator to determine their ability and competence in line with their own potential such as financial, technical, administrative, and executive (MMRA, 2021). The following table displays brief details about five major categories under Saudi Arabia's contractors' classification system:

TABLE I: SAUDI ARABIAN CONTRACTORS' CLASSIFICATION

Grading Area	Highest financial value for a single project in Millions of Saudi riyal (SAR)				
	I	II	III	IV	V
Roads	Over 300	300	100	30	10
Water and sanitation	Over 300	300	100	30	10
Buildings	Over 200	200	50	15	5
Electrical	Over 200	200	50	15	5
Mechanical	Over 200	200	50	15	5

Source: https://contractors.momra.gov.sa/contractorslistpage1.aspx

With reference to the above table, under the grading area of Roads and Water and sanitation work, the Grade I contractors are allowed to bid on projects with a value of more than 300 million Saudi riyals (SAR) whereas Grade II above 100 million but up to 300 million, Grade III above 30 million but up to 100 million, Grade IV above 10 million but up to 30 million and Grade V less than 10 million of SAR.

Under the grading area of Buildings, Electrical work, and Mechanical work, the Grade I contractors are allowed to bid on projects with a value of over 200 million whereas Grade II above 50 million but up to 200 million, Grade III above 15 million but up to 50 million, Grade IV above 5 million but up to 15 million and Grade V less than 5 million.

B. Statistics of Classified Contractors as Per Geographical Regions

Table II displays the Statistics of classified contractors as per geographical regions. The first part of the table shows statistics up to the year 2004 and the second part displays the total number of classified contractors as of 2018. It can therefore be inferred that there is a significant growth in the number of classified contractors over a span of 14 years. The number has almost doubled. With numerous developmental projects, KSA is one of the largest construction industries in the world (Al-Yami & Sanni-Anibire, 2019). The construction industry of any country indicates its level of development and prosperity. Starting and establishing a successful construction business involves numerous risks and challenges. Failure in construction business is among the highest failure rates in business (Assaf *et al.*, 2015).

TABLE II: STATISTICS OF CLASSIFIED CONTRACTORS AS PER GEOGRAPHICAL REGIONS

Regions	Number of classified contractors in all fields according to regions as of 2004					
	I	II	III	IV	V	Total
Riyadh	42	58	73	412	239	824
Mecca	6	17	28	96	60	207
Medina	0	1	2	23	16	42
Eastern	9	10	24	82	73	64
Qassim	2	5	7	38	12	198
Asir	0	0	5	43	31	79
Tabuk	0	0	0	0	0	0
Hail	0	1	0	11	4	16
Northern	0	0	0	3	0	3
Jizan	0	1	3	10	3	17
Najran	0	0	1	16	38	55
Al-Baha	0	0	0	4	6	10
Al-Jawf	0	0	4	8	2	14
Total	59	93	147	746	484	1,529
	Number of classified contractors in all fields according to regions as of 2018					
Riyadh	87	78	129	300	635	1,229
Mecca	16	27	40	102	311	496
Medina	5	9	7	30	72	123
Eastern	18	25	36	68	182	329
Qassim	1	2	6	33	126	168
Asir	2	8	18	51	159	238
Tabuk	0	1	5	9	7	22
Hail	0	2	7	15	27	51
Northern	0	0	7	12	24	43
Jizan	0	1	8	34	69	112
Najran	2	2	10	33	126	173
Al-Baha	0	1	0	2	16	19
Al-Jawf	0	1	1	11	23	36
Total	131	157	274	700	1777	3039

Source: https://old.momra.gov.sa/GeneralServ/statistic.aspx

The ultimate objective of every business activity is to attain financial success and a construction project business is no exception. According to Bageis *et al.* (2019), the principal feature of construction business success is the selection of right project for bid. Traditionally, the success parameters for construction industries are project cost, time, and quality which are related to project site management.

However, according to Tripathi and Jha (2017), project success does not necessarily define the success of the construction organization. Projects only partially contribute to the overall success of an organization (Nenni *et al.*, 2014). Many construction companies tend to fail within the first few months of operation and are unable to make any signs of growth or survive due to their competition with well-established large construction companies.

According to Abu Bakar *et al.* (2012) the reason for the limitation of growth of small construction firms is linked to their size. On the contrary, as per Assaf *et al*. (2013), opportunities in the form of projects of different sizes and locations, especially those located in remote areas are available to small contractors as these kinds of projects are deemed uneconomical by medium and large contractors.

Many different factors affect the performance of the construction industry as it is complicated and dynamic (Jadid, 2013). According to Mohamed *et al*. (2006), there are several disputes and problems such as conflicts between project parties, projects cost overrun, and delay in delivering the projects are major factors, whereas a detailed analysis performed by AlSehaimi *et al*. (2013) on the previous studies conducted in the field of delay in construction in developing countries including Saudi Arabia, revealed the most crucial delay factor to be inefficient project management related factors. However, Al-Emad *et al*. (2017) mention that the most significant cause resulting in construction disputes amongst the stakeholders in the construction industry is payment delay.

According to Elawi *et al.* (2016) delays are a major cause for concern in the Saudi Arabian construction industry. According to Al Hammadi and Nawab (2016) construction delays lead to increase in overall project cost, whereas according to Bin Seddeeq *et al*. (2019) in Saudi Arabian construction industry cost overrun sometimes occurs because of poor estimation that could be one of the reasons for the gap in the financial turnover in between construction companies.

However, Alsuliman (2019) argued that delays are among the inevitable challenges that one may face during the execution of construction projects. According to Falqi (2019) limited research is available on the extent of delay in Saudi Arabian construction industries based on the primary data.

Therefore, it is necessary to identify the main factors for the gap in the financial turnover between Saudi Arabian construction companies in order to overcome this critical problem.

In available studies, success factors have been evaluated at a project level which can be considered as a short-term approach. In order to be competitive in the changing business environment, firms must focus more on corporate success too. Thus, a shift must be made from focusing on project success to focusing on corporate success in construction organizations to compete in the dynamic marketplace.

Therefore, the focus of this research paper is to explore the

various management-related factors influencing the construction companies of Saudi Arabia and try to determine if the corporate management team or the site management team has a significant effect on the overall performance and success of construction companies by forming following hypotheses:

H₁: Corporate management team related factor of payment delay has a high impact on the success/failure of construction companies

H₂: Project site management team-related factor of poor project management has a high impact on the success/failure of construction companies

II. LITERATURE REVIEW

A. Success/Failure Factors of Construction Companies

A literature review relating to studies conducted on issues facing the Saudi Arabian construction industry has been performed and the researcher has attempted to identify all the success/failure factors as listed by previous researchers. Jadid (2013) explored and analyzed the obstacles facing the Saudi Arabian construction companies by using quantitative methodology. The study consisted of 71 Saudi contractors from the construction sector with grading area of buildings. Data was collected using a bilingual digital survey interactive comprehensive questionnaire. Out of the 74 factors that were studied, managerial cause topped the list with the maximum percentage.

Research was conducted by Assaf *et al.* (2013) to identify the factors responsible for the failure of huge number of small-scale companies in the construction sector in Saudi Arabia by using quantitative and qualitative research methodology. The research included 43 small contractors. A literature review was conducted, and 16 factors were identified for the failure of small contractors in the construction industry. The major factors identified were management incompetence, difficulties in acquiring talented personnel, inefficient accounting systems, absence of strategic business plans and being dependent on a limited customer base.

Research was conducted by Ali *et al.* (2013) for the identification of key performance indicators for Saudi Arabian construction companies by using quantitative research methodology. Through literature review they have identified a list of 47 potential performance indicators for measuring the performance of company at the corporate level. The result revealed financial success factors (profitability, growth, financial stability and cash flow) as most important factors and manager competency was ranked 16th place. The survey was conducted by randomly selecting sample of 67 large construction companies in the Grade I category specialized in building works.

Bageis and Alshehri (2019) investigated major factors responsible for the success of Saudi Arabian construction companies by using qualitative research methodology. They conducted a semi-structured interview by using an open-ended questionnaire. The majority of participants agreed that factors such as owner-manager characteristics, financial conditions and business management are important for achieving success. 10 participants were recruited for data collection purpose that belonged to renowned small

construction companies with grading areas of waste management (water and sanitation work). The data collection method used was primary qualitative. Explanation building process has been used by the study to analyze the qualitative data. Based on the themes formulated according to responses gathered from the participants, thematic analysis including set of analytical processes was used for data interpretation.

Recently, Tuffaha *et al.* (2020) conducted research to develop a framework for assessing construction contractors' performance in Saudi Arabia by using quantitative research methodology. The use of literature review was made for the identification of key performance indicators (KPIs) that are commonly used. The selected set of KPIs were prioritized by the method of relative importance index (RII) based on feedback received by 53 participants out of 67 sample size with grading area of building with Grade I, II and III classified contractors. These factors were further grouped using principal component analysis (PCA). The findings of their research revealed that the performance group (people, business performance, productivity) ranked highest, followed by the satisfaction group (end user's satisfaction, client's Satisfaction, Profitability) ranking 2nd, actual metrics (cost of construction, time of construction) ranking 3rd, estimated metrics (construction cost & time predictability) ranking 4th, compliance (quality & defects, regulatory compliance, health and safety) ranking 5th.

An analysis of the above literature by Jadid (2013), Assaf *et al.* (2013), and Bageis and Alshehri (2019) has led the researcher to the conclusion that the studies identify the role of management-related factors as the most important factor in the success or failure of the Saudi Arabian construction companies. On the contrary, Ali *et al.* (2013) ranked the financial success factor as the most important factor and manager's competency was ranked as less important while Tuffaha *et al.* (2020) ranked the performance group (people, business performance, productivity) as highest indicator of the Construction Company's success.

However, within the management team, many parties such as corporate management team, project site management team interact and work with each other to manage the construction organization. Therefore, the management body may not be considered as one entity as it would dilute their responsibilities. If all management team members are grouped under one category, it would be difficult to identify who exactly was responsible for each issue. Therefore, it is necessary to identify which aspects of the management team is responsible for the issues facing the organization.

Top five success/failure factors are taken from each literature and presented based on their severity level. There are total 60 success/failure factors based on 12 literature reviews. It is found that out of 60 success/failure factors, around 34 success/failure factors are common among the literature and 26 success/failure factors have different views.

The most common factors are as follows: delay in payments supported by 6 literature, poor qualification, competency and capability of the contractors' key personnel, poor communication among project participants, poor planning and scheduling and poor labor productivity each supported by 3 literature. Table III summarizes the top five success/failure factors as identified by various researchers in the literature review.

TABLE III: TOP FIVE SUCCESS/FAILURES FACTORS AS IDENTIFIED THROUGH LITERATURE REVIEW

Authors	Top Five Success/Failures Factors				
	1st	2nd	3rd	4th	5th
Al-Kharashi & Skitmore (2009)	Poor qualification of the contractor's technical staff	Poor site management and supervision by contractor	Contractor experience	Suspension of work by the owner/client	Delay in approving major changes in the scope of work by consultant
Albogamy *et al.* (2013)	Low performance of the lowest bidder contractor	Delays in sub-contractor's work	Poor qualification, skills and experience of the contractor's technical staff	Poor planning and scheduling of the project by the contractor	Delay in progress payments by the owner
Alhomidan (2013)	Internal administrative problems	Payment's delay	Poor communication between construction parties	Delays in decision making by management team	Incapable Qc inspectors
Ikediashi *et al.* (2014)	Poor risk management	Budget overruns	Poor communication management	Slippage of project schedule	Poor estimation practices
Assaf *et al.* (2015)	Lack of contractor experience in particular business field	War	Poor project management	Poor cost estimation	unavailability of stationed project leader at site
Al Hammadi & Nawab (2016)	Slowness of owner decision making process	Delay in contractor's payment by owner	Late in revising and approving design documents by owner	Due to short original contract duration	Delay to furnish and deliver site to contractor by owner
Mahamid (2016)	Payment's delay	Poor communication among project participants	Poor planning and scheduling	Poor labor productivity	Poor quality site documentation
Alhajri & Alshibani (2018)	Poor site management and supervision by contractors	Conflict between the main contractor and subcontractor	Poor planning and scheduling of projects by the contractor	Delays in material or equipment delivery	Delays in Handing Over Construction Site to the Contractor
Alsuliman (2019)	Focus on financial analysis and awarding the lowest bidder	Awarding contractor's projects beyond their financial and technical potential	Selection of contractors who have other faltering projects	Delay of payments from owner	Weakness of the financial and technical capabilities of some contractors
Alshehri (2019)	Variations orders issues	Other delay issues	Performance and workmanship issues	unforeseen site conditions	Delay in payments
Mathar *et al.* (2020)	Competency and capability of the contractors' key personnel	PM competency, authority and involvement	Clear communication channels between the owner/PM and the designer,	Commitment of all project participants to the established schedule and budget	Clear communication channels between the owner/ PM and the contractor
Gopang *et al.* (2020)	Client's decision-making process and changes in control procedures	Design error	Labor skills level,	Design changes by Client or Consultant	Issues regarding permissions/ approvals from other stakeholders

Source: Researcher's compilation (2021)

The Management of any organization is its backbone and therefore it is imperative to have efficient and competent management that may prevent the occurrence of huge losses to the company.

According to Dikmen *et al.* (2010), one can examine the value chain of a construction company at the corporate and project site level, the site management of the company also plays a significant role in reducing the overall cost.

As detailed in the literature review, the respondents of most research conducted were mainly contractors, business owners, clients, and consultants.

Therefore, the research mainly reflects their point of view lacking feedback from employees. Therefore, in next section various success/failure factors are listed for the identification of a range of factors related to management that influence the construction companies of Saudi Arabia and try to determine if the corporate management team or the site management team has greater contribution on the overall performance, growth, and success of construction companies.

Based on the above literature review, it can be concluded that the role of management-related factors is identified as the most important factor in the success or failure of Saudi Arabian construction companies. The literature review also revealed that none of previous research cover all of five major grading areas: Roads, Water and sanitation work, Buildings, Electrical work, and Mechanical work with Grade I, II, III and IV classified contractors including all thirteen provinces of Saudi Arabia.

Studies of Jadid (2013), Albogamy *et al.* (2013), and Al Hammadi and Nawab (2016) covered only grading area of building, Assaf *et al.* (2013) mostly grading area of building and Ali *et al.* (2013) grading area of the building with Grade I and Tuffaha *et al.* (2020) grading area of building with Grade I, II & III only.

The research of Bageis and Alshehri (2019) concentrated on small construction companies with grading area of water and sanitation work. Study conducted by Mathar *et al.* (2020) covered only Grade I classified contractors and the study of Assaf *et al.* (2015) was performed on Grade I classified contractors but limited to industrial petrochemical projects.

Study of Mahamid (2016) covered only Grade II and Al-Kharashi and Skitmore (2009) study covered only Grade III classified contractors whereas Alshehri (2019) study included only Grade I, II, and III and IV. Research performed by Alhomidan (2013) was done on contractors classified with grading area of Road and study of Ikediashi *et al.* (2014) included infrastructure works, whereas a study of Gopang *et al.* (2020) covered railway infrastructure construction works which mostly comes under grading area of Road. The work of Alsuliman, (2019) covered public construction projects

and whereas the research of Alhajri and Alshibani (2018) was done on petrochemical projects.

Therefore, in pursuit of answering the research question **"What are the main corporate and project site management factors responsible for the increase in financial turnover gap between construction companies established during the same time period in Kingdom of Saudi Arabia?",** the researcher felt the need for conducting studies that would cover all of five major grading areas: Roads, Water and sanitation work, Buildings, Electrical work, and Mechanical work with grade I, II and III classified contractors including all thirteen provinces of Saudi Arabia with feedback from contractors, business owners, clients, and consultants as well as employees.

B. Success/Failure Factors Related to Corporate Management and Project site management

Based on the literature review, 36 relevant success/failure factors were identified (18 related to corporate management and 18 related to project site management) to test the following research hypotheses of this research as listed in Table IV and Table V.

- Corporate management team related factor of payment delay has a high impact on the success/failure of construction companies
- Project site management team related factor of poor project management has a high impact on the success/failure of construction companies

III. RESEARCH METHODOLOGY

A. Study Population and Sample Size

This study includes the viewpoint of contractors/ business owners/ employees of Saudi Arabian construction companies in Grade I, Grade II, and Grade III categories with grading area of Roads, Water and sanitation work, Buildings, Electrical work and Mechanical work only as classified by Ministry of Municipal and Rural Affairs (MMRA). According to MMRA's Statistics of classified contractors, there were total 329 classified contractors in above-mentioned categories. The details have been summarized in Table VI.

TABLE IV: SUCCESS/FAILURE FACTORS RELATED TO CORPORATE MANAGEMENT

Sr. No	Success/Failure factors
1	Lack of contractor experience in particular business field
2	Suspension of work by the owner/client
3	Delay in approving major changes in the scope of work by consultant
4	Delays in decision making by management team
5	Payment's delay
6	Low performance of the lowest bidder contractor
7	Internal administrative problems
8	Budget overruns
9	Client's decision-making process and changes in control procedures
10	Awarding contractors' projects beyond their financial and technical potential
11	Selection of contractors who have other faltering projects
12	Design changes by Client or Consultant
13	Poor cost estimation
14	Due to short original contract duration
15	Delays in material or equipment delivery
16	Weakness of the financial and technical capabilities of some contractors
17	Clear communication channels between the owner/ PM and the contractor
18	Issues regarding permissions/ approvals from other stakeholders

Source: Researcher's compilation (2021)

TABLE V: SUCCESS/FAILURE FACTORS RELATED PROJECT SITE MANAGEMENT

Sr. No	SUCCESS/FAILURE FACTORS
1	Competency and capability of the contractors' key personnel
2	Poor project management
3	Poor communication between construction parties
4	Delays in sub-contractor's work
5	Poor risk management
6	Poor labor productivity
7	Poor site management and supervision by contractors
8	Variations orders issues
9	Design error
10	PM competency, authority, and involvement
11	Poor planning and scheduling
12	Unforeseen site conditions
13	Commitment of all project participants to the established schedule and budget
14	Slippage of project schedule
15	Poor quality site documentation
16	Incapable Qc inspectors
17	Delays in Handing Over Construction Site to the Contractor
18	Conflict between the main contractor and subcontractor

Source: Researcher's compilation (2021)

B. Statistics of classified contractors as per grading area

Table VI displays the Statistics of classified contractors by considering grading area as classified by MMRA as per the latest published open data. Out of the total 3,045 contractors, 564 contractors belong to Grade I, Grade II and Grade III category. From these 564 contractors, 235 belong to 'other grading area'. The remaining number of 329 contractors belong to grading area of Roads, Water and sanitation work, Buildings, Electrical work, and Mechanical work.

TABLE VI: STATISTICS OF CLASSIFIED CONTRACTORS AS PER GRADING AREA

Grading Area	2018					
	I	II	III	IV	V	Total
Roads	12	14	31	94	168	319
Water and sanitation	12	26	32	98	193	361
Buildings	19	35	78	147	202	481
Electrical	12	11	20	109	245	397
Mechanical	8	7	12	39	199	265
Other Grading areas	69	64	102	213	774	1,222
Total	132	157	275	700	1,781	3,045

Source: https://old.momra.gov.sa/GeneralServ/statistic.aspx

As discussed in previous section, none of the researchers have covered complete population size of Grade I, Grade II and Grade III with grading areas of Roads, Water and sanitation work, Buildings, Electrical work and Mechanical work MMRA classified contractors in the Saudi Arabian construction industry. Therefore, in order to represent the 329 Targeted population size, this study targets above 329 samples from all the 13 regions of Saudi Arabia. Saunders *et al.* (2019) agree with the view that a sample exactly representing the target population from which it is taken is ideally the perfect representative sample.

C. Research Methodology

This research shall use epistemological with positivist philosophy because it allows the researcher to use the scientific method with observable and measurable facts. The study has made use of quantitative research methods with deduction approach to analyze the factors that contribute to the success/failure of construction companies. The rationale behind the use of quantitative research methodology is to reduce the study bias and to cover the targeted population as far as possible.

Quantitative studies assist in gathering measures of data that are reliable (Johnson & Turner, 2003) and are, therefore, suitable for this study. Since qualitative research is preferred in relatively new topics consisting of unknown variables as per (Fellows & Liu, 2015). The present research is conducted by using a web-based survey questionnaire targeted at the sample size of 400 professionals from all regions of Saudi Arabia including all demographic levels. Hair *et al.* (2020) acknowledges that samples that are selected appropriately give sufficiently accurate information for the use of decision-making purposes in business. This research also includes the female construction professional, as detailed in Literature review section, none of the previous researchers have included female participants.

According to Saudi Woman Report (2020) by General Authority for Statistics, Saudi women represent almost half of Saudi society around 49 %. As per the Ministry of Human Resources and Social Development, the Saudi female engineers make 6% in the Saudi Arabian construction industry (Saudi Gazette, 2020). The participants have been selected to include 50 % corporate management and 50% other project site management related employees to reflect an unbiased view that would include the point of view of top management as well as site employees. For the Data Analysis, SPSS software is used to find Cronbach's alpha (Cα) for the testing of the reliability of data and Chi square to test whether two variables are independent or associated. Relative importance index, severity index, frequency index, importance index and frequency adjusted importance index type descriptive statistical analysis methods are used to analyze the data.

IV. RESULTS AND ANALYSIS

A. Demographic Profiles

Based on the result of the demographic profiles of survey respondents (Table VII), it was revealed that the majority (84% i.e., 337/400) of survey respondents belonged to middle age group (26 -55 years) and around 97% were holding a high level of educational qualification (bachelors, master's degree and PhD holders).

TABLE VII: DEMOGRAPHIC PROFILES OF SURVEY PARTICIPANTS

	Age	Frequency	%
Participants' Age profile	18 - 25 years	27	6.8%
	26 - 40 years	232	58.0%
	41 - 55 years	105	26.3%
	55 years or older	36	9.0%
	Total	400	100%
	Years of work experience	Frequency	%
Participants' Total years of work experience	1- 5 years	61	15.3%
	5 - 10 years	84	21.0%
	10 - 15 years	85	21.3%
	15 - 20 years	81	20.3%
	Above 20 years	89	22.3%
	Total	400	100%
	Gender	Frequency	%
Participants' Gender	Male	370	92.5%
	Female	30	7.5%
	Total	400	100%
	Education	Frequency	%
Participants' Educational qualification	Diploma	12	3.0%
	Bachelor	265	66.3%
	Master	120	30.0%
	PhD/Doctorate	3	0.8%
	Total	400	100%
	Years of work experience	Frequency	%
Participants' Years of work experience in KSA	1- 5 years	102	25.5%
	5 - 10 years	125	31.3%
	10 - 15 years	105	26.3%
	15 - 20 years	30	7.5%
	Above 20 years	38	9.5%
	Total	400	100%
	Profession	Frequency	%
Participants' Profession	Engineer/Supervisor	198	49.5%
	Manager	147	36.8%
	Project Director	24	6.0%
	GM/CEO/MD	24	6.0%
	Business Owner	7	1.8%
	Total	400	100%

Source: Processed Research Data (2021)

The survey included 8% female participants, with 64% senior-level (above 10 years of experience) of experienced professionals including 75% professional with more than 5 years of Saudi Arabian construction industry experience by almost equal representation of corporate management (Managers, Project director, GM/CEO/MD and Business owner) as well as project site management (Engineer/Supervisor) strongly validate the research that the participants were fully mature to understand the subject matter to answer the research question.

Table VII displays the demographic profiles of survey participants.

In order to identify if the participant's views are influenced by their backgrounds (i.e., corporate management team or project site management team) and also to confirm if the data taken represents the sample population, the non-parametric Chi-square test was conducted to test the objectivity. The distribution of the participants' backgrounds is measured through this test in their response to the question about the success/failure factors responsible for the increase in the financial turnover gap for construction companies to examine if their backgrounds have an impact on them by forming the following null hypothesis, H_0 - participant's views are influenced by their backgrounds.

Equation (1) shows the Chi-square calculation.

$$\alpha = 0.05, \ \chi^2 \alpha df = 49.2 * 0.05 * 16 = 39.36 \quad (1)$$

where;
case $\chi^2 > \chi^2 \alpha df$

Therefore, the null hypothesis (H_0 - participant's views are influenced by their backgrounds) is rejected.

B. Reliability statistics

The data collected was analyzed in a reliable manner being consistent with the collection method and data type. The survey results for the 36 success/failure factors related to corporate as well as project site management is grouped by factor ID. Out of 14,400 responses (400 participants multiplied by 36 factors with one selection by each), the combined response frequency of disagree and strongly disagree are very low (8.48%) which indicate the strong validity of factors.

After the collection of raw data gathered from survey responses, it was analyzed using statistical methods. Within quantitative analysis, software such as excel are used for drawing diagrams and calculations. Although, there are many computer packages available for data analysis (Al-Sudairi, 2007) but advanced software such as Statistical Analysis System (SAS), Stata, Statistical Package for the Social Sciences (SPSS) is used for more advanced statistical analysis and data management (Saunders *et al.*, 2019).

A Cronbach alpha α test was performed by using SPSS software on all the responses to check the reliability of data and internal consistency within the responses and to determine whether various groups of participants had different viewpoints about success/failure factors related to corporate management team as well as project site management team. A greater value of α denotes greater internal consistency or stronger inter-criteria correlations and

vice versa, the value of α ranging from 0 to 1.

Table VIII displays the reliability statistics obtained for Cronbach alpha α obtained by SPSS software. The Cronbach alpha α for a combination of all 36 factors related with corporate management and project site management was 0.922 which is acceptable. The value obtained when the 18 factors related to corporate management and project site management were tested separately was found to be 0.837 and 0.896 respectively.

According to Doloi (2009), and Almahmoud and Doloi (2020) Cronbach alpha $\alpha > 0.7$ is acceptable.

Therefore, the Cronbach alpha value of the survey obtained, being greater than 0.7 indicated a high internal consistency and reliability of the survey deeming it valid for further statistical analysis.

TABLE VIII: RELIABILITY STATISTICS

Reliability Statistics			
Group	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Combination of both corporate management and project site management	0.922	0.922	36
Success/Failure factors related to corporate management for the testing of H_1	0.837	0.839	18
Success/Failure factors related to project site management for the testing of H_2	0.896	0.896	18

Source: Processed Research Data (2021)

C. Testing of Hypotheses

In order to verify to what extent a proposed hypothesis can be accepted, the process of hypothesis testing is performed. The survey data including responses of success/failure factors were re-grouped as per their respective hypothesis to perform the analysis so that the answer for this research question could be obtained based on result of analysis.

As advised by Mathar *et al.* (2020) by considering only a limited set of factors, an accurate assessment of factors leading to success is undermined, therefore, to achieve the aim of this research top five factors influencing the construction companies of Saudi Arabia as listed in below table are further evaluated to determine their level of impact on the overall performance and success of construction companies.

Table IX displays descriptive statistics analysis of survey results of top five factors by utilizing Relative importance index (RII), Severity index (SI), Frequency index (FI), Importance index (IM) and frequency adjusted importance index (FAII) type descriptive statistics analysis methods.

The factors are ranked in descending order with respect to their RII scores. Out of 36 success/failure factors, the factor of 'Payment delay' was ranked highest which falls under corporate management group whereas 'Poor project management' secured 3rd ranking in overall factors while within project site management group it ranked 1st.

TABLE IX: SUMMARY OF TOP FIVE SUCCESS/FAILURE FACTORS

Corporate management group	Project site management group	Group ranking	Overall Ranking	RII Score
Payment's delay	–	CR1	R1	84.95
Poor cost estimation	–	CR2	R2	83.30
–	Poor project management	PR1	R3	83.10
Low performance of the lowest bidder contractor	–	CR3	R4	82.50
Delays in decision making by management team	–	CR4	R5	82.15

Source: Processed Research Data (2021)

In terms of lowest ranking, 'Incapable QC inspectors' was ranked lowest which falls under project site management group whereas 'Due to short original contract duration' was ranked lowest within corporate management group.

The factor of payment delay by securing 1st rank, tested the first hypothesis of corporate management team related factor of 'payment delay', whereas the factor of 'poor project management' by securing 1st rank within project site management group, tested the second hypothesis which were formed to answer the research question of this study as detailed in the Introduction section.

D. Timeline Analysis of Results

Table X displays the timeline analysis of results obtained under this research. The top five identified success/failure factors have been plotted on a timescale as per their respective research years. It is noticed that respondents show their agreement with factors that were identified by researchers from period of 2009 to 2019. Surprisingly, none of the factors from year of 2020 identified by Mathar *et al*. (2020) and Gopang *et al*. (2020) were ranked within top five.

However, two factors identified in year of 2019 by Alsuliman (2019), and Alshehri (2019) not only secured their ranking within top five but also one of the factors, 'payment delay' ranked highest.

Therefore, the Author decided to investigate the issues by revisiting the result analysis before moving to the conclusion so that it could be fully adopted for further recommendation to Saudi Arabian construction companies.

After an in-depth analysis of top five identified success/failure factors in order to achieve the objective of this research, the author has performed timeline analysis to integrate it within current environment so that the results obtained from the research would provide insight to companies for better identification of issues that may be facing the organization and therefore, help in formation of policies that may benefit the organization.

E. Research Findings

The research findings identified that out of top five factors, the four success/failure factors were related to corporate management and only one was related to project site management which draws a conclusion towards the significance of corporate management team.

TABLE X: TIMELINE ANALYSIS OF RESULTS

Corporate management group	Project site management group	Group ranking	Overall Ranking	Timeline of Previous Researches											
				2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Payment's delay	–	CR1	R1	–	–	–	–	▪	–	–	▪	–	–	▪	–
Poor cost estimation	–	CR2	R2	–	–	–	–	–	▪	–	–	–	–	–	–
–	Poor project management	PR1	R3	–	–	–	–	–	–	▪	–	–	–	–	–
Low performance of the lowest bidder contractor	–	CR3	R4	–	–	–	–	▪	–	–	–	–	–	▪	–
Delays in decision making by management team	–	CR4	R5	▪	–	–	–	–	–	–	▪	–	–	–	–

Source: Author's work (2021)

TABLE XI: RANKING COMPARISON

	Factor ID	Success/Failure factors related to corporate management group	Success/Failure factors related to project site management group	Based on RII, SI, FI, IM and FAII		Based on combined Likert scale of Strongly Agree and Agree	
				Group ranking	Overall Ranking	Group ranking	Overall Ranking
1	C13	Poor cost estimation	–	CR2	R2	CR1	R1
2	C5	Payment's delay	–	CR1	R1	CR2	R2
3	C16	Weakness of the financial and technical capabilities of some contractors	–	CR5	R6	CR3	R3
4	S2	–	Poor project management	PR1	R3	PR1	R4
5	C4	Delays in decision making by management team	–	CR4	R5	CR4	R5

Source: Author's work (2021)

In order to integrate the identified success/failure factors with current business environment, the timeline analysis of factors was performed. Which revealed that none of factors from year of 2020 secured their ranking within top five and therefore upon noticing the exclusion of factors, when author revisited the result analysis section; he noticed respondent's slightly low agreement level in support of 'payment delay factor than poor cost estimation factor. Whereas, according to descriptive statistics analysis of results ranked in descending order with respect to their RII scores, the factor of payment delay secured 1st rank.

Therefore, the Author decided to re-do the analysis of the factors based on the frequency of Survey responses on a combined Likert scale. Ranking comparison between RII and the frequency of survey responses on a combined Likert scale is shown in Table XI

The comparisons result revealed that the factor of Poor cost estimation secured 1st rank due to high agreement level than factor of payment delay. Whereas Spearman's rank correlation ranking comparison between RII & combined Likert scale yielded with 96% of agreement level.

However, the factor of payment delays has less disagreement level than factor of poor cost estimation. Therefore, payment delay should be considered the most significant delay factor than poor cost estimation.

V. CONCLUSIONS AND RECOMMENDATION

A. Conclusion

According to rationale of this research paper various management (project site and corporate) related success/failure factors influencing the Saudi Arabian construction companies have been investigated and evaluated to determine if the corporate management team or the site management team related success/failure factors have a significant effect on the overall performance and success of construction companies and responsible for the increase in financial turnover gap between construction companies established during same time period in KSA.

Based on survey result received from 400 professional working in Roads, Water and sanitation work, Buildings, Electrical work, and Mechanical work with grade I,II & III classified construction companies from all thirteen provinces of Saudi Arabia including all demographic levels as well as by considering the highest agreement level, the positive results of non-parametric Chi-square test which rejected the possibilities of bias if the participant's views are influenced by their backgrounds deemed it valid for further statistical analysis and Cronbach alpha α being greater than 0.7 indicated a high internal consistency and reliability of the survey.

The descriptive statistics analysis of survey results by utilizing RII, SI, FI, IM and FAII methods yielded similar results. Spearman's rank correlation ranking comparison in between RII & combined Likert scale yielded with 96% of agreement level. The factor of 'payment delay' from corporate management group being ranked highest in term of RII score, tested the first hypothesis of corporate management team related factor of 'payment delay', whereas the factor of 'poor project management' by securing 1st rank within

project site management group, tested the second hypothesis which were formed to answer the research question of this study.

According to result analyses as presented in table 09, due to the highest RII scorings of the success/failure factors related to the corporate management (Payment's delay, Poor cost estimation, Weakness of the financial and technical capabilities of some contractors and Delays in decision making by management team) revealed the importance of corporate management issues for the survival of Saudi Arabian construction companies. Therefore, most significant factors that a firm must consider in order to avoid bankruptcy and reduce possibility of failure are corporate level decision making by company management. Whereas the result analyses also revealed that except for the factor of 'poor project management' the success/failure factors related to project management team was less supported by participants.

B. Recommendation

Based on the conclusion of result analysis, under this section recommendation is provided to achieve the objective of this study so that the results obtained from this research may provide insight to Saudi Arabian construction companies to help them in formation of their company policies that may benefit the organization to reduce the financial turnover gap between them.

The following are recommendation for top five success/failure factors:

1) Payment's delay

Al-Emad *et al.* (2017) recommended that contractors should make use of progressive payment options for creating cash flow plans and managing their requirement of financial resource. Therefore, Alshehri (2019) advised the hiring of well qualified cost managers who are able to advice on the judicious allocation of financial resources on the basis of work progress. In order to understand the priority of fund based on technical requirement it is recommended to both owner & contractors to hire competent finance manager with project management certification so that he can properly allocate the fund based on project's technical requirements.

Project sponsor should also avoid generating cash flow by wrong procurement strategy not aligned with plan and project requirement to avoid the delay of critical materials required for the projects as per plan. But clients must also fulfil their role of payment obligations to contractors to support the project cash flow so that required resources can be arranged as per plan. However, clients do not hold payment of contractors willingly and in most cases all of dues are released within few months. The research of Shash and Qarra (2018) revealed that the majority (65%) of the Saudi Arabian contractors were in agreement that the approval process for invoiced work was a significant factor in delaying invoicing payments and only 5% of the participating contractors agreed with disputes and budget shortages as being major reasons for delay in payments.

In order to reduce the impact of payment delay on project, it is recommended to owners to pay at least partial payment on monthly basis to support worker's salaries to boost motivation as well as to arrange critical materials. It can be facilitated if actual information regarding project expenditures be presented clearly and in a way that clients can

understand (Alotaibi *et al.,* 2015). Additionally, it is recommended that there should be reserved contingency fund not less than 5% of overall project value by equal contribution from client and contractor both to fund the project during critical stage.

2) Poor cost estimation

The basic cause is lack of strategic partnership and joint ventures with key suppliers and vendors with company's procurement department. The payment delay to suppliers and vendors is major cause behind this. Improper co-ordination and lack of support by not arranging timely quotations from suppliers and vendors during bidding stage also yield up with poor cost estimation by estimation department.

In order to avoid poor cost estimation, top management must ensure proper coordination in between the procurement department and estimation department. As concluded by Assaf *et al.* (2018), poor design package during bidding stage is forcing contractors to apply unjustified contingency which leads to poor cost estimation, this issue can be resolved by hiring competent estimation engineers with design engineering backgrounds.

3) Weakness of the financial and technical capabilities of some contractors

The basic cause of this issue is policies and strategies formulated by incompetent finance managers including the corporate technical management team. However, sometimes it is due to the interference of business owners. Although the contractor selection in Saudi Arabia is a challenge for clients (Price & Al-Otaibi, 2010), but technically qualified contractors must be selected by clients to enhance project performance and cost. According to Assaf *et al.* (2019) before awarding of contracts, clients should consider contractor's capabilities as well as their financial situation and sources and it should not solely be on the financial proposal submitted by contractors.

Small contractors should initially target short and mid-form contracts to reduce financial turnover gap due to weakness of the financial and technical capabilities. Additionally, it is recommended to adopt Joint venture & collaboration strategies with contractors having strong financial and technical capabilities to participate in mega projects.

4) Poor project management

In order to overcome this issue, contractor should hire well qualified and competent corporate departmental managers including HR team to avoid the hiring of incompetent project management team in each department. According to Assaf & Al-Hejji (2006) by utilizing expertise and knowledge of contractors' trained workforces, delays in projects can be prevented. In order to reduce cost, most of the construction companies used to promote some of their existing engineers to managerial positions which pose serious risk to project and lead to poor project management due to lack of project management skills.

Therefore, it is recommended that top management must carefully evaluate engineers' project management skills before recruiting or promoting them as a managerial position or promotion should be conditional by ensuring that the candidate engineer possesses a master's degrees such as MSc, MBA, PMP or equivalent certification which will help them

to increase value management. Khawam and Bostain (2019) also have similar recommendations. Additionally, poor project management practices can be improved by adopting suitable project management methodologies such as lean agile project management methodology as it encompasses the entire project life cycle.

5) Delays in decision making by management team

Organizations face this issue where their corporate team members are posted in key positions based on the number of years of service and loyalty within the company regardless of their skills and capabilities. However, sometimes delay in decision making by the management team may be the natural outcome of the complex negotiation process with clients which can be avoided by arranging negotiation-related short trainings and courses for corporate management team members.

As discussed in the literature review section, the management of any organization is its backbone, therefore it is imperative to have an efficient and competent management team with good negotiation and decision-making skills that will prevent the incurrence of huge losses to the companies. In addition, lack of moral orientation of senior leadership could be also one of the prime reasons. This issue can be resolved by arranging necessary training for corporate team members through industry experts and consultants providing training.

According to the research methodology used in previous literatures, author noticed that only one research by Assaf *et al.* (2013) was conducted by use of mix methodology (qualitative & Quantitative) whereas all latest research was conducted quantitively and most of them are based on decades old finding. Therefore, for further future research on Saudi Arabian construction companies, it is recommended to conduct more research by use of qualitative research methodology to include the latest issues and challenges being faced by Saudi Arabian construction companies.

CONFLICT OF INTEREST

Author declares that he does not have any conflict of interest.

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