

THE ENGINEERING CONSULTANCY PROFESSION “ANALYSIS AND DEVELOPMENT”

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The environment of the construction industry is characterized by exhibiting a complex structure due to the interference of many different parties and professions, each with its own unique attributes. During the course of conducting work, each party and profession interact internally and externally with other parties and professions. Such interactions could have negative and/or positive effects which ultimately translate into either the success or failure of a construction project. The aim of this paper is to expose and analyse those internal and external factors that affect the work of the A/E consultancy firms. Knowing such factors will enable A/E firms to improve their methods and abilities of conducting work and interact more smoothly and effectively with other parties, which will ultimately reflect positively on the success and profitability of construction projects. Several engineering consultancy firms were interviewed and the results were analysed. Recommendations were brought up and further work was mentioned.

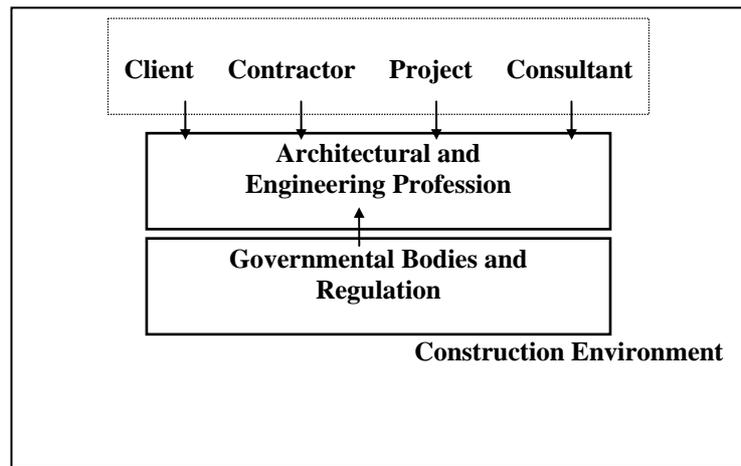
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INTRODUCTION

The Saudi Construction Industry has undergone great leaps in the last twenty years which had to cope with the great wealth of the nation. Big changes in technology and administrative levels benefited those who wanted to change, but left behind others who could not cope with change. The consultancy profession in construction was greatly underdeveloped uptill the mid seventies, with few nationals entering the market each year. Some consultants could adapt to the boom in construction activities, while others could not and were left behind not benefiting technically, socially, or even economically. Things settled down by the late eighties and the boom was over. Consultants active nowadays are either veterans of the boom era or new comers to the market. Little data is available on this profession, and there is an evident lack of research covering this part of the construction industry.

Literature review shows that the environment in which consultants work can be influenced by several factors. These factors can be grouped under five main categories or groups; Client, Contractor, Project, Government Bodies and Regulations and the Consultants themselves. These again can be arranged in two major groups; the first for factors external to the construction industry and those internal to it. The only group external to the construction industry was that related to the government bodies and regulations, with the remaining four groups (client, contractor, project and consultant) making up the internal factors category. The external and internal factors will all be coloured by the construction environment in the country of study (Figure - 1).

Figure - 1 External and Internal Factors affecting the A/E Profession



This study looks into the opinions of A/E firms as to the major factors affecting their work at present. These factors and/ or their weights could change by time, so this study could be conducted at several years intervals to monitor major changes in results.

METHODOLOGY

A questioner was designed to interview the A/E Consultants. This questionnaire was built on the views of three Consultants that were interviewed by the researchers to verify factors affecting the work of A/E Consultants. The factors were grouped under five major categories namely: Client, Contractor, Project, Government Regulations and Consultant.

The factors and the groups were as follows:

I. Client Related Factors

1. Available Time for Design Work
2. Design Fees
3. Client's Cultural Level
4. Client's Administrative Ability
5. Client's Time for Decision Making
6. Too Many Variations
7. Confidence Level in Consultant
8. Late Payments to Consultant
9. Standard of Client's Technical Staff
10. Standard of Client's Administrative Staff
11. Client's Expectations
12. Lack of Information from Client's Side

II. Contractor Related Factors

1. Technical Level
2. Administrative Level
3. Adherence to Time Schedule
4. Adherence to Quality Standards
5. Financial Ability

III. Project Related Factors

1. Project Location
2. Degree of Complexity
3. Soil Problems
4. Size of Project
5. Good Personal Relations between Consultant and Contractors' Staff.
6. Moral of Personnel Working on Site
7. Clarity of Specifications and Contract

IV. Government Bodies Related Factors

1. Amenities Provided during Construction Period
2. Visa Issuance to Recruit Foreign Personnel for Consultants
3. Municipality Procedures
4. Nationalization Issues
5. Absence of a Standard Measurement Code
6. Absence of a Standard Model Contract
7. Absence of Standard Local Building Specifications

V. Consultant Related Factors

1. Existence of An Organizational Chart
2. Existence of a Job Description
3. Existence of an Internal Auditing System
4. Personnel Turnover (in comparison to Consultants years in business)
5. Existence of a Procedure Manual
6. Over Inspection
7. Over Stick Specifications
8. Use of Computer Software
9. Upgrade of Computer Software
10. Existence of a Document Control System
11. Use of Standard Forms (minutes of meetings and reports)
12. Existence of a Site Safety Manual
13. Level of Salaries Pay to Technical Staff
14. Financial Strength of Consultant
15. Well Co-Ordinated Contract Documents
16. Volume of Work VS Real Ability of Consultant

RESEARCH SAMPLE

There were some general questions on the size of the A/E firm and its years in business and the Clients they serve whether public or private (or a combination of both). The sample of A/E Consultants was chosen from the Western Region of Saudi Arabia as a representative Sample of the country. Forty four firms were personally interviewed. A significance test was made to test the following three hypothesis:

H1 : Years in business of an A/E firm will not influence the factors affecting its profession.

H2 : Type of client (public or private) will have no influence on the factors an A/E firm thinks will affect its work.

H3 : The size of the A/E firm (in terms of its annual turnover) has little or no effect on what the firm sees as main factors affecting the profession.

RESULTS

The sample of Consultants showed that 36.45% were less than eight (8) years in business, 29.5% were between eight (8) and fifteen (15) years in business and 34.1% were over fifteen (15) years in business. More than half of those less than eight (8) years in business worked solely for the private sector while under half of them worked for both private and public sectors with the private sector accounting for 75% of their turnover. Over 93% of this sample had an annual turnover of less than one (1) million Riyals (266,000 US dollars) while under 7% had a turnover of 1-3 million Riyals and none had a turnover of over 3 million.

Those who were between eight and fifteen years in business had nearly evenly distributed percentages between client categories (either only private, private and public accounting for 25% or less or private and public accounting for more than 25%). More than half had a turnover of less than one million Riyals, 30% were between 1-3 million and over 15% had a turnover of more than 3 million.

Those who were over fifteen years in business had 40% of them working solely for the private sector with over 26% working for both private and public sectors with the public sector accounting for 25% or less of their turnover, and over 55% having Clients from both sectors with the public sector accounting for over 25% of turnover. More than half of this category had a turnover of under one million Riyals with less than half having a turnover of 1-3 million Riyals. None of this group had a turnover of over three million.

It was observed that those with the highest turnover were in the 8-15 years-in-business group.

Table (1) Years in Business Relation to Other Factors

Years in Business	% of Sample	Client (%)			Turnover (%)		
		Private	Govt.<25%	Govt. >25%	< 1 M	1-3 M	> 3 M
Under 8	36.4	56.3	43.8	-	93.8	6.3	-
8 - 15	29.5	38.5	30.8	30.8	53.8	30.8	15.4
Over 15	34.1	40.0	26.7	33.3	53.3	46.7	-

Table (2) Kinds of Client's relation to Other Factors

Client	% of Sample	Years in Business			Turnover (%)		
		< 8	8 - 15	> 15	< 1 M	1-3 M	> 3 M
Private	45.5	45.0	25.0	30.0	85.0	15.0	-
Govt.<25%	34.0	46.6	26.7	26.7	73.3	26.7	-
Govt.>25%	20.5	-	44.5	55.5	22.2	55.6	22.2

Table (3) Turnover Relation to Other Factors

Turnover	% of Sample	Years in Business			Client		
		< 8	8 - 15	> 15	Private	Govt.<25%	Govt. > 25%
< 1 M	68.2	50.0	23.3	26.7	56.7	36.7	6.6
1 - 3 M	27.3	8.3	33.3	58.4	25.0	33.3	41.7
> 3 M	4.5	-	100.0	-	-	-	100.0

DISCUSSION OF THE HYPOTHESIS

- H1:** Statistical tests showed that we accept the Null hypothesis that years in business of an A/E firm will not influence the factors affecting its profession. This shows that all Consultancy firms would be affected by the same factors irrelevant how many years each of them has been in business.
- H2:** Tests showed that we reject the null hypothesis that the type of Client (public or private) has no influence on the factors an A/E firm thinks will affect its work. This indicates that a consultancy firm will have differing factors affecting its work depending on what client it works with.
- H3:** The hypothesis that the size of the A/E firm in terms of its annual turnover has little or no affect on what the firm sees as main factors affecting its profession was rejected. This indicates that the size of the firm has a direct impact on the factors affecting its profession.

On analyzing the results, weights were used to signify each of the importance levels (from 1-4, with 4 used for the very important column). The ten major factors affecting the total sample with their respective weights were as follows:

Table (4) The 10 Major Factors Affecting the Total Sample

Rank	Weight	Group	Factor
1	68	Contractor	Contractor’s adherence to the required level of quality.
2	68	Contractor	Technical level of Contractor
3	65	Project	Clarity of specifications and contract
4	64	Client	Level of Client’s confidence in Consultant
5	64	Client	Time available for design work
6	64	Contractor	Contractors adherence to time schedule
7	62	Client	Design fees (percentage)
8	60	Consultant	Consultant’s over inspection
9	60	Consultant	Over strict specifications
10	59	Consultant	Existence of an organizational chart (Consultant)

It was observed from table (4) that the factors related to Contractors rated high while those related to Consultants were at the bottom of the table which indicates that A/E firms believe that the factors affecting their work and related to them come after those factors related to Contractors, Clients or the Project.

In the Consultant related factors group the results showed a ranking of factors as follows with their respective weights.

Table (5) Consultant Related Factors with Rank and Weights

Rank	Weight	Factor
1	60	Over Inspection
2	60	Over-Strict Specification
3	59	Existence of An Organizational Chart
4	58	Existence of an Internal Auditing System
5	58	Well Co-Ordinated Contract Documents
6	58	Volume of Work VS Real Ability of Consultant
7	55	Upgrade of Computer Software
8	55	Existence of a Job Description
9	54	Level of Salaries pay to Technical Staff
10	54	Existence of a Site Safety Manual
11	54	Use of Computer Software
12	12	Existence of a Document Control System
13	53	Financial Strength of Consultant
14	49	Personnel turnover (in comparison to consultants years in business)
15	47	Use of Standard Forms (minutes of meetings and reports)
16	46	Existence of a Procedure Manual

Total Factors in all five categories (Client - Contractor - Project Govt. Regulation and Consultant) amounted to forty eight. They were grouped for the sake of measuring importance into three groups. Any factor appearing in the first ten was considered of high importance, in the middle twenty eight factors as of medium importance and in the last ten factors as of low importance. Table (6) below shows what percentage of each of the five categories of factors appeared at the three different levels of importance.

Table (6) Level of Importance of the Five Categories

Category	Percentage Appearing in:		
	High Importance	Medium Importance	Low Importance
Client	23	46	31
Contractor	60	40	-
Project	14	57	29
Govt. Regulations	-	71.5	28.5
Consultants	18.5	69	12.5

From table (6) it is noticed that the largest percentage of any category appearing in the High Importance column is that of Contractors with the balance appearing in the Medium Importance only with none in the Low Importance column. This indicates the big emphasis that consultants put on the contractor-related factors that effect the consultancy profession.

None of the factors of the Government Regulation and Bodies category appear in the High Importance column. Most of them appear in the Medium Importance and under a third of them in the Low Importance columns. This indicates that the government bodies and regulation -based factors have no great effect on Consultancy work.

The factors of Client and Project categories appear in all columns of importance with the Medium Importance column showing the highest percentages.

The consultant-based factors show low presence in both the High and Low Importance column with around 70% of this category's factors showing in the Medium Importance column. This may indicate that consultants do not see themselves as the major factors affecting the profession, but that they are rather of a medium importance while giving first place to contractors.

A graphical representate of the above discussion is shown in the figure below:

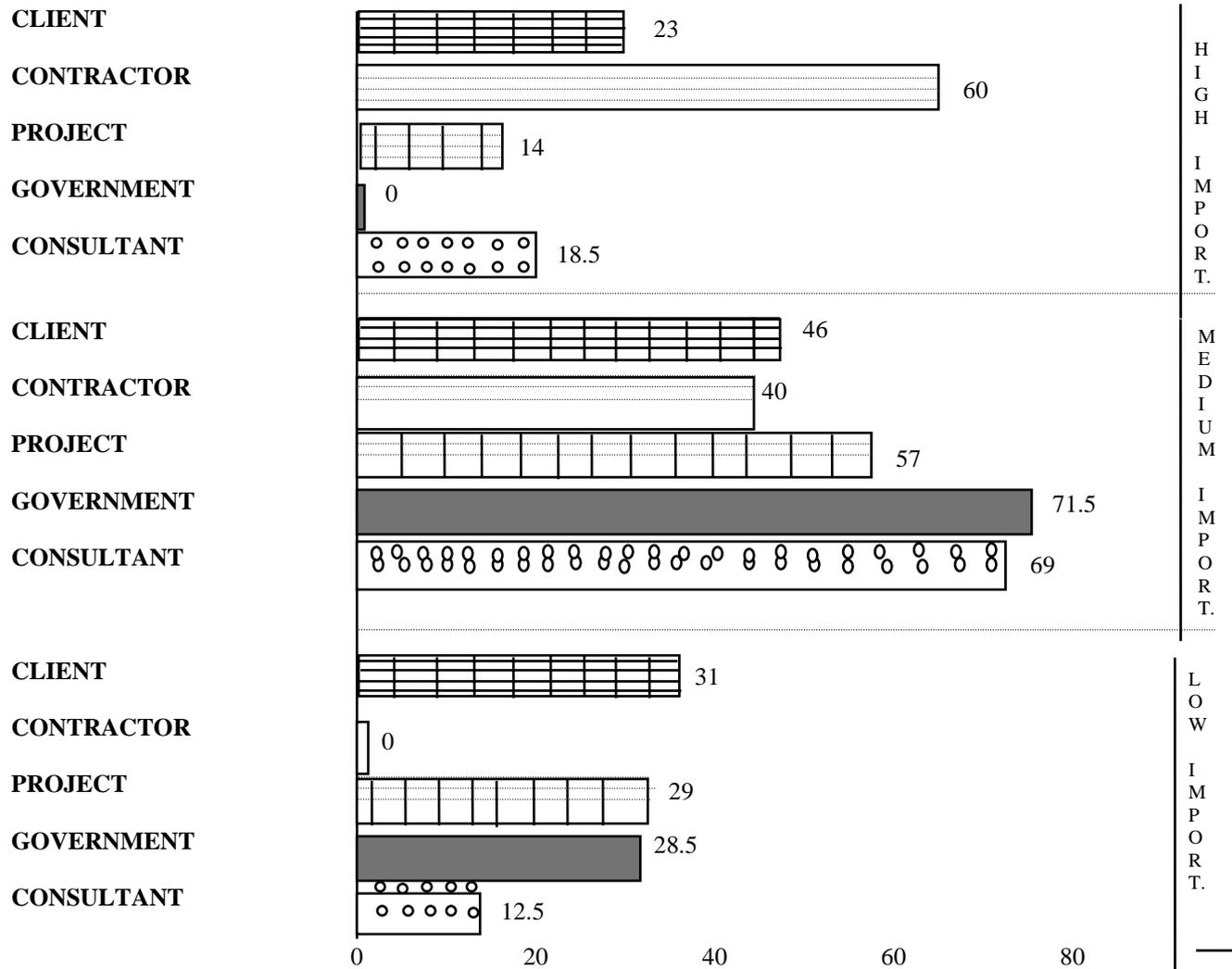


FIGURE -2 LEVEL OF IMPORTANCE OF EACH CATEGORY

Table (7) Relation of Factors to Size of Firm (in terms of turn over)

Factor	Category	Rank		
		Turnover Under 1 M	Turnover 1 - 3 M	10 General Major Factors
Technical Level of Contractor	Contractor	1	3	2
Contractor's Adherence to Required Level of Quality	Contractor	2	1	1
Clarity of Specifications and Contract	Project	3	5	3
Level of client's confidence in Consultant	Client	4	4	4
Contractor's Adherence to Time Schedule	Contractor	5	8	6
Time Available for Design Work	Client	6	2	5
Design Fees	Client	7	6	7
Consultants Over Inspection	Consultant	8	9	8
Ease of obtaining visas to recruit foreign personnel for consultants	Govt. bodies & regulation	9	-	-
Over Strict Specifications	Consultant	10	7	9
Existence of an Organizational Chart (at Consultant's Firm)	Consultant	-	10	10

In Table (7) above a comparison is made between the ten major factors stated by A/E firms split according to size of firm (in terms of annual turnover) and compared to the major factors stated by the whole sample .Some similarity in the results is seen in the first four factors between the two sizes of firm and in comparison to the general results. Some difference is noticed between both sizes in the importance of the contractor's adherence to time schedules and the time available for design work ; smaller firms putting more weight on the former and less weight on the latter compared to larger firms. Smaller firms had some concern on the difficulty in recruiting foreign personnel while bigger ones didn't share that concern .Bigger firms saw some importance in the existence of an organizational chart at the A/E firms while smaller firms did not. The size of the firm definitely has an impact on the factors affecting each firm's work.

CONCLUSION

This paper has identified that there is a lack of research on the local construction profession, and that adequate information is essential in order to compile a reliable database on the anatomy of the Architectural/ Engineering (A/E) Consultancy Profession in Saudi Arabia.

It has been shown that the kind of Client (public or private) will have differing effects on the work of consultants. The size of the A/E firm will also have a direct impact on the factors affecting its working atmosphere. It has also been shown that years in business of a firm have no direct effect on the factors affecting its work.

One of the findings of the study was that consultants rated contractors as the major group (out of five groups) in affecting a consultancy firm's work, while consultants rated themselves as of medium importance to the outcome of their work, and rated client - related factors (as a group) as more important than consultant-related factors in the impact on their profession. The government bodies and regulations related factors was also rated as of medium importance by consultants.

Overall the study has shown that consultants believe that their is a bigger impact on the outcome of their work (positive or negative) by contractors than their is an impact by themselves.

RECOMENDATIONS

The researchers recommend that better mechanisms of contractor choice are to be adopted by the construction industry in Saudi Arabia. Classification of contractors must be updated periodically to reflect the real technical and administrative level of contractors.

FURTHER WORK

There is room for further research to survey the point of view of other parties to the construction industry in Saudi Arabia about the factors affecting their work too. Contractors and Clients are the major targets.

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