

ORGANIZATIONAL EFFECTIVENESS IN CONSTRUCTION: A CONCEPTUAL FRAMEWORK

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Organizational effectiveness is a difficult concept to define and measure especially in the construction industry due to its project-based nature. The different schools of thoughts and corresponding models proposed in the literature approach organizational effectiveness from different starting points and do not cover all perspectives valid for the construction industry. Within the context of this paper, an attempt has been made to explore the current state of knowledge on organizational effectiveness and applicability of proposed models, mainly based on goals, systems, competing values and contradiction schools, in the construction industry. A conceptual framework has been defined to measure organizational effectiveness from multiple perspectives based on the idea that organizations that utilise the right strategies, structure, management style, culture and resources most appropriate for the organization to be able to reach their long term objectives according to the influencing groups within the business environment and environmental forces are effective organizations. There are three parts of the model: organization and its subsystems (strategies, structure, culture and resources), business environment (other parties such as subcontractors, partners etc.) and macro environment (political and economic forces stemming from the country factors). How organizational factors are utilised during the construction process, relations with the influencing groups support construction value chain and a company adapts to changes in the macro environment have been questioned to measure the level of effectiveness. A questionnaire has been designed to collect data on means and ends of organizational effectiveness as defined within the conceptual framework. The validity of the parameters has been examined statistically by empirical data obtained from the survey answered by 116 Turkish contractors. Major determinants of organizational effectiveness are found to be the ability to benefit from market opportunities, experience of the company, level of partnering, culture, organizational learning ability, technical capability, financial resources and flexibility

Keywords: organizational effectiveness, performance, quantitative analysis.

INTRODUCTION

The concept of organizational effectiveness (OE) has been dealt with so many years and its importance for high performance and long run survival is mentioned by many researchers (Steers 1975, Sinha and McKim 2000). However, the number of quantitative and qualitative models that explain OE within construction companies are rather low. The main reason for this could be attributed to the lack of a strong framework for defining OE and a consistent and universal set of criteria for assessment of OE in construction. The project-based nature of construction industry necessitates an organizational effectiveness framework that takes into account of complexity of the construction value chain, where activities of a high number of parties and various environmental factors are affecting its performance. Therefore, within the context of this paper, considering the need for redefining OE in construction companies, the current state of knowledge on OE has been explored and

a framework has been proposed. This framework helps to explain organizational effectiveness, to model the process of defining what makes an organization efficient and finding attributes that contribute to OE in organizations. Taking this framework as the basis, a set of criteria has been identified to be able to measure the level of effectiveness in construction organizations. In order to predict the level of effectiveness, two prediction models have been developed by utilizing artificial neural networks and multiple regression techniques. Since results of the comparative study of these prediction models have been reported elsewhere, only some preliminary information will be given about the prediction model development process and their performances. The main objective of this paper is to introduce the conceptual framework, which is the basis of further prediction models and to discuss major determinants of OE in construction companies as found from the prediction models.

DIFFERENT APPROACHES TO EFFECTIVENESS

Literature survey on organizational effectiveness reveals that most of the theories have limited applicability in the construction industry. In order to build a comprehensive framework for construction companies, different schools of thoughts have been investigated and combined under five major headings as; goals, systems, strategic constituencies (Miles Ecology Model), competing values and contradiction schools of thought.

Organizational effectiveness by goals school

Being one of the first approaches proposed to the literature of OE, the goals school defines OE in terms of accomplishment of predetermined goals without considering the effects of systems (basically firm infrastructure, strategies, culture and capabilities), influential groups (internal and external strategic constituencies) and macro environmental factors on level of OE. Thus, whenever an organization attains its planned objectives, it is said to be effective or vice versa. Based on this goal oriented perspective, Robbins (1990) and Price (1972) focused on time dimension of objectives and defined OE as achievement of short and long term goals. Similarly, Hannan and Freeman (1977) measured OE by the degree of correspondence between the organizational goals and the achieved outcomes. Although the approach proposes a measurable perspective for OE, it is incomplete for the definition of OE as it only deals with the “ends” of OE rather than the “means” and the factors influencing these means. It is also based on the assumption that the goals of an organization are measurable, attainable, realistic and static. However, the goals of an organization tend to change as people, organizational politics and environmental factors change. Hence, the goals school of thought has limited applicability. However, it introduces the importance of “objectives” while defining OE, which will be taken into account during the model development.

Organizational effectiveness by systems school

Systems school proposes that organizations are effective only if the organizational “means” (people, communication channels, resources, investments in R&D, processes and firm infrastructure), which are essential to reach the “ends” are healthy and appropriate for long-term survival of the organizations. The internal consistency in terms of organizational infrastructure, motivation and productivity of people, resource allocation, technology of processes, etc. is required to increase overall effectiveness. Bourgeois (1980) stated that internal system efficiency and its comprehension by all the people may be more significant than comprehensive agreement on goals of the

organization. From this perspective, OE has been defined as a collection of systems that convert inputs into outputs, export them to environments, and monitor changes in the environments for survivability. However, the systems view may be criticised due to the fact that infrastructure and systems are the indispensable but not the unique features of OE. Objectives, strategic constituency expectations, relations within the competitive environment and impacts of macro environmental factors are important parameters that define how the “systems” work within an organization. Thus, although it has got some breakthroughs, systems approach underpins the importance of “productive systems, resources and firm infrastructure” in the definition of OE.

Organizational effectiveness by strategic constituencies school

Miles (1980) defined his “Ecology Model” to form a platform to combine goals and systems approaches for defining OE. In this model, he explained the concept of strategic constituencies. According to this approach, organizational effectiveness is attained when an organization distinguishes its strategic groups and satisfies their demands. Constituencies are important for the organization as they are essential for company survivability (like customers, investors, etc.) or they affect actions and decisions of the organization (like employees, managers, etc). Accordingly, Miles (1980) defined OE as the “ability of the organization to minimally satisfy the expectations of its strategic constituencies”. The success of the approach lies on the ability of the organization to reveal its most important strategic constituencies, to understand their demands and to satisfy them. Tsui (1990) expressed that both the systems and goals schools of effectiveness conceive the top management or the owner(s) as the sole constituency of the organization, which is the major contrast between these approaches and the constituency model. By considering the effects of other strategic groups on the organization, the strategic constituency model has a wider perspective than the other models. However, this approach is also criticised as strategic constituencies’ priorities are dynamic and may loose or gain rank as the external and internal conditions change. Quinn and Cameron (1983) confirmed this with their research that an organization’s constituencies change when the organization’s position changes on the evolution curve. However, this approach emphasises the importance of “internal and external stakeholders” which should be taken into account while defining OE.

Organizational effectiveness by competing values school

Competing values approach for OE has been developed by Quinn and Rohrbaugh in 1980s. It is based on the previous studies carried out by Scott (1977) and Seashore (1979). The general idea behind this approach is that there is not a specific set of criteria that best reflects OE and thus, diverse preferences are combined under a competing model. The competing and opposite values are flexibility vs. control, internal vs. external and means vs. ends. Developers anticipate that although exceptional organizations may be high performing in all of the perspectives, logically, if an organization is high performing in one respect then, it shows less effectiveness in the opposite respect. The idea that organizations can not perform well in other competing values is the major deficiency of the approach.

Organizational effectiveness by contradiction school

Proposed by Hall (1987), the contradiction approach has been developed as a solution to the contradictions of the other models of organizational effectiveness. Hall’s model depicts that organizations may be effective in some areas but not all areas due to the contradictions imposed by the multiple constraints, namely; goals, resources and

systems, constituencies, government and time frames (Banner and Gagné 1995). Accordingly, the general definition of effectiveness from this perspective can be summarised as; if the organizational constraints, namely; goals, constituencies, systems, government, regularity agents and promised time frames are investigated elaborately, prioritized according to their values to the organization and fulfilled without contradicting to the other groups, then OE is achieved. Other models which are not so widely known on organizational effectiveness are fault-driven model, which describes the effective organizations as having no faults or faulty traits; legitimacy model which explains the effectiveness as engagement in legitimate activities and lastly, high-performing systems model which defines the effectiveness as being judged as excellent relative to comparable competitors (Cameron 1986). As a result, each school of thought emphasizes the role of different attributes for achieving OE. By incorporating the basic ideas of each school of thought and revising the attributes according to the characteristics of the construction industry, a framework has been proposed to define OE in construction companies.

Organizational effectiveness in construction companies

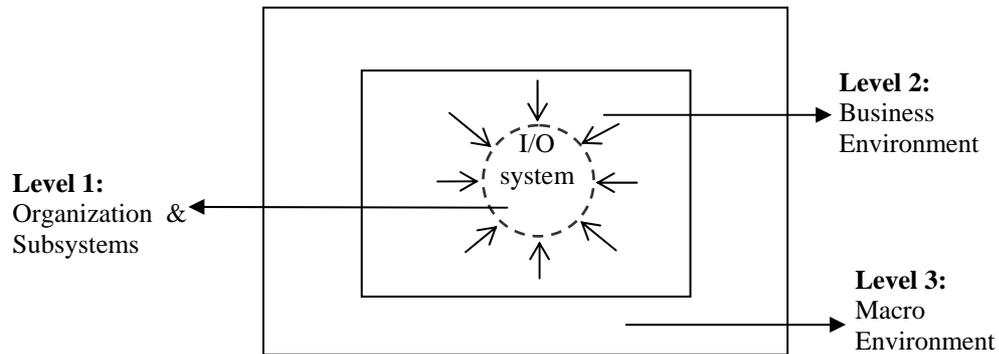
When different definitions of OE according to different schools of thought are considered, it is evident that OE is basically about efficiency of the value chain which is the basic “means” to achieve predefined objectives and satisfy the requirements of strategic constituencies. Complexity of the OE concept in construction companies may be attributed to the following factors;

The construction value chain has two basic parts: the corporate level and the project level activities. Thus, the value is created at the project level with the supporting activities taking place at the corporate level. The “value” is primarily defined by the client and the objectives in each project tend to change with respect to the requirements of the client/customers. Consequently, the efficiency of the value chain depends on how the corporate level activities support the project value chain and how the corporate level objectives comply with the project success criteria.

There are numerous parties involved in the construction value chain which are the client, JV partners, suppliers, subcontractors, consultants, etc. Thus, effectiveness depends on how the activities of all the parties are integrated to fulfil the project performance criteria.

The vulnerability of the project success to external conditions necessitates that the project, company, competitive and remote environments should be considered together, as each inner level is significantly affected from the outer level. Consequently, OE is about how the construction value chain is operated in a company, in the existence of the forces coming from the competitive and remote environments as well as how the indirect impacts of these forces are managed at the project level.

Due to the above explained complications of OE in construction, a multi-dimensional approach and a new definition have to be adapted. Within the context of this research, the organizations that utilize the right strategies, firm infrastructure, culture and resources most appropriate for the organization to be able to reach their long term objectives according to the influencing groups within the business environment and environmental forces are defined as effective organizations. The “appropriateness” of the systems has to be defined by taking into account of project-based nature of the industry and integrated value chain. Based on this definition, a conceptual framework has been defined to model and measure OE in construction companies whose details are explained within the next section.



1: Levels of proposed organizational effectiveness framework

FRAMEWORK TO MODEL ORGANIZATIONAL EFFECTIVENESS IN CONSTRUCTION COMPANIES

The multi-dimensional framework is composed of 3 parts, namely; organization and its subsystems, business environment and macro environment (Figure 1). Thus, OE is defined to be associated with how the organizational strategies, structure, culture and capabilities support its main activities (comprising both the corporate and project management phases), how the nature of the relations with the influencing groups (including the constituencies) in the business environment support/inhibit the company value chain and how the company adapts itself to macro environmental forces.

Consequently, the following attributes collected under three categories (namely, organization, business and macro environments) together with the general characteristics of the company (like age, size, major client organization, etc.) have been defined to model and further, measure the level of OE in construction companies:

1. Organization and its subsystems: The “means” of OE that stem from the organization’s internal environment are primarily; strategies, structure, culture and capabilities. Integrated organizational structure, which is related with leadership style, hierarchy, communication channels, information flow, etc. is the basic ‘means’ that organizations use to operate the value chain. Similarly, capabilities and resources (tangible as well as intangible) are used/deployed during all the phases of the value chain and they determine the level of competitive advantage. OE is basically about how these capabilities are utilized to convert inputs to outputs during the construction phase as well as the existence of necessary inputs to run the construction business. Culture, which is defined as the language the organization uses, the history that it owns and the way of doing things in the future (Hesselbein *et al.* 1997) is a determinant of existence of a suitable internal environment which fosters/hinders effective operation of the value chain. The level of bureaucracy, organizational learning and innovation shape the ways of doing things in an organizational setting and acts as a ‘means’ of OE. Lastly, the strategies and strategic choices of an organization are significant determinants of OE as they are the ways/tools used to achieve the preset objectives. How the strategies match with the strengths, weaknesses, opportunities and threats determine the success of a company. Mode (cost leadership vs.

differentiation) and scope of competition (focus vs. diversification), as defined by Porter (1985), determine the way a company operates to achieve competitive advantage. All of the organizational means are interrelated and how different capabilities, culture, structure and strategies come together in an organizational setting derives OE rather than their individual influences. Although, each setting is treated as an individual category, it is apparent that considering strategies, capabilities, etc. as standalone concepts can be rather simplistic and misleading.

2. Influencing groups in the business environment: OE is related with how the value chain of a company is integrated effectively with those of other parties (subcontractors, JV partners, etc.) in each project and how the relations with other parties (clients, suppliers, etc.) are constructed to minimize the impact of the competitive forces acting on the company according to the strategic position it aims to attain in the business environment.
3. External forces due to the macro environment: The way an organization identifies and copes with the external changes happening in the macro environment determines the way it uses its 'means' to achieve OE. Thus, external forces (like political, economical, legal, etc fluctuations) are included within the model to illustrate the relationship between organizational means, environmental forces and OE.

RESEARCH METHOD

The above mentioned factors that constitute the basic architecture of the proposed framework have been transformed into quantifiable measures to understand the OE concept in construction companies. The initial set of criteria comprising of 27 attributes has been defined to measure OE level and listed in Table 1. General characteristics like age, size, major client of the organization, etc. have also been included in the list because these factors may influence OE level as well. The data necessary for the research have been collected by a survey conducted among Turkish general contractor companies. In the questionnaire, the respondents are required to identify the values of the parameters that are given in Table 1, as well as to evaluate the OE level of their companies. A total of 175 questionnaires have been sent to all the members of Turkish Contractors Association (TCA) as well as the companies that operate in international markets. 116 of the questionnaires returned back leading to a 66.28% of return rate. The target population of the construction sector for this survey has been determined as medium-big size companies, whose average income level has been calculated as 60 million USD \$ per year for the 116 respondents. In the questionnaire, most of the criteria were measured using 1-5 Likert scale, where 1 and 5 indicated the lowest and highest levels, respectively. Age, yearly turnover, etc. have been collected as numeric values, whereas the rest have been measured as logical values (indicating yes/no) and categorical variables (like autocratic/democratic while determining leadership style; government/private for determining major client, etc.). In this research, subjective reporting approach, which has been developed by Dess and Robinson (1984), has been used for determining OE levels. The respondents have been asked to evaluate their level of OE by using a subjective 1-to-5 scale according to the definition made at the beginning of the questionnaire.

Table 1: Initial list of the parameters used for measuring OE level

Classification of criteria	Criteria	
Organization and its subsystems	Strategies	Strategic long range planning
		Mode of competition (cost leadership/ quality differentiation)
		Scope of competition (diversified/focus)
	Structure	Business strategy (percentage of type of projects mainly involved): housing, building other than housing, engineering, infrastructural works, industrial
		Departmental orientation (teamwork/hierarchy)
		Restructuring within last ten years
		Corporate leadership style (autocratic/democratic)
	Culture	Project leadership style (autocratic/democratic)
		Corporate management type (family owned & operated/ professional)
		Strength of culture
	Capabilities	Strength of bureaucracy
		Level of organizational learning
		Innovative capacity
		Financial capability
		Technical capability
Investment in employees		
Experience		
Ability to benefit from market opportunities		
Investment capability for research and development (RD)		
Business Environment Macro Environment	Effectiveness of information flow (IT capability)	
	Frequency of joint venturing (JV)	
General Characteristics	Relations with client organizations	
	Adaptability/flexibility to cope with environmental changes	
	Age	
General Characteristics	Yearly turnover	
	Major client organization (government/private)	
General Characteristics	Internationalization ratio	

Since the data set for this research was limited and therefore required limited number of input parameters, a statistical package, namely Statistical Package for Social Sciences (SPSS 9.0) has been utilized to reduce the number of criteria affecting OE levels. In order to reduce the number of indicators and develop the models only with statistically significant parameters, parametric and non-parametric tests have been utilized according to the differing nature of data types (numeric, ordinal, nominal, etc.). Parametric tests require that parameters are normally distributed whereas; non-parametric tests are utilized without necessity of such an assumption. Since it has been observed that the data set was normally distributed, by using ANOVA, means compare and Kruskal Wallis (K-W) tests, the insignificant variables at 5% significance level have been eliminated. It has been observed that the insignificant parameters were mainly from the general characteristics of the organization. Age of the company in the selected market, yearly turnover value, internationalization ratio, type of major client organization (primary client as government or private) have been determined as insignificant parameters in terms of OE. Similarly, the strategic choice at the business level (percent involvement in different project types) has been examined to be insignificant on level of effectiveness. The 22 significant parameters have been used to construct prediction models based on artificial neural networks (ANN) and multiple regression (MR) techniques to measure OE level in construction companies. The main reasons to construct prediction models were (1) to test the validity of the conceptual framework and question whether the defined attributes satisfactorily explain OE in companies, (2) to predict OE level, so that companies can use the model as a tool for organizational health check, (3) to identify basic

determinants of OE as derived from the prediction models. How the prediction models have been constructed and the major outcomes of the conducted comparative study have been reported elsewhere (Dikmen *et al.* 2003), hence the details will not be mentioned here. However, it is worth mentioning that ANN slightly outperformed MR model in terms of the errors and correlations between the actual and predicted results and in terms of the relations between the input and output parameters.

DETERMINANTS OF OE IN CONSTRUCTION

As a result of the comparative study of the prediction models, the most important determinants of OE have been found as;

- ability to benefit from market opportunities
- experience
- frequency of joint venturing (JV)
- strength of culture
- level of organizational learning
- technical capability
- financial capability
- adaptability/flexibility to cope with environmental changes
- effectiveness of information flow.

These 10 criteria have been obtained by changing each input criterion and observing the output change in ANN model, whereas in MR model they have been obtained by monitoring the coefficients of the independent parameters. Many of these determinants have been proven to be significant also by other researchers (Jain 1997, Steers 1975).

It is observed that OE is more related with “culture” and “capabilities” rather than “strategies” and “structure”. This may be due to the fact that, it is not the strategies or structure, but how the strategies and structure match with organizational characteristics and culture that brings success. Ability of the company to benefit from market opportunities has been determined as the most important factor, which is an attribute under the category of ‘capabilities’. Environmental scanning conducted to find threats and opportunities in the business environments can help organizations to weaken the effects of the competition and unexpected fluctuations. The strong relation observed between ability to benefit from market opportunities and OE is not surprising because in developing countries like Turkey, where the market is characterized by rapid changes and fluctuations due to the macro level uncertainties and business level relations, effective organizations are the ones that can comprehend and respond to these fluctuations by knowing the markets well enough. In a similar manner, under the same category, financial and technical capabilities of an organization together with its experience in a specific market have been defined as other important determinants of OE. It is worth mentioning that experience has been observed to be more essential than financial and technical capabilities. Besides, “effectiveness of information flow” has been found as a significant determinant of OE. Therefore, if an organization can manage its information and use technology to

store, retrieve, manipulate and access knowledge in a fast and accurate manner, its OE is high.

Strong and well-communicated culture and organizational learning level have also been determined as the key factors for achieving OE. It is the culture that shapes every single action inside the organization; from the decision making to action plans in the corporate level to the simplest transactions at project level. Therefore, for effectiveness, the organizational culture should be well shared inside the organization at both the corporate and project levels. Similarly, organizations utilizing major learning sources and using mechanisms to enhance learning are observed to be much more effective than the others.

Adaptability/flexibility capability of the organizations to the market and macro level fluctuations and frequency of joint venturing activities have also been observed to impact OE level. Whenever an organization realizes the uncertainties brought by the macro and market levels by making environmental scanning process a regular task of the management level and is flexible enough to adapt the new situations, it achieves better effectiveness levels.

CONCLUSIONS

Within this paper, it has been proposed that, a new conceptual framework is necessary to model OE in construction companies. A conceptual framework comprising of 3 levels and corresponding 27 attributes have been defined to measure level of OE. Results of the questionnaire, based on the proposed framework and answered by 116 Turkish contractors, have been used to develop a prediction model and determine the major determinants of OE. Research findings demonstrate that ability to benefit from market opportunities, experience, frequency of JV, strength of culture, level of organizational learning, technical and financial capabilities, adaptability/flexibility to cope with environmental changes and effectiveness of information flow are the most significant attributes that affect the level of OE in the construction companies. Results point out the importance of macro environment and thus, environmental scanning as a management activity in construction companies. The importance of relations within the business environment has also been proved; as the frequency of JV has been found to significantly increase overall OE. Moreover, culture of an organization has been found as far more important than technical resources and strategic choices. Similarly, level of organizational learning, which partly measures the strength of corporate memory, is a major determinant of OE in construction companies pointing out the importance of intangible assets when compared with tangible ones. Although the management style is not among the major determinants of OE, it has been found that, OE is higher in companies having a professional management style when compared with family owned and operated companies.

As a final note, it has to be highlighted that research findings about major determinants of OE and prediction models only reflect realities of the Turkish construction industry, which may also hold true for other developing countries characterized by turbulent macro environments. However, the same conceptual model proposed within this paper, can be used to construct similar models to predict OE in construction companies operating in different countries.

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