Organizational Effectiveness of Building Project Organisations and Greenfields to Develop

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Abstract

The purpose of this paper is to explore and categorise the different approaches used to determine organizational effectiveness of construction project organizations. First, the conceptualization of organizational effectiveness is reviewed. This resulted in three main approaches that are used to categorise the approaches used within construction literature. Then, based on a structured literature search in scopus, the main approaches applied within construction industry based research are categorised and potential areas for further development have been determined. It has been found that the use of the multiple constituencies approach to organizational effectiveness is very limited within construction literature, while it may deepen our understanding on the determinants of construction project success.

Keywords: Effectiveness, Performance, Construction project organization.

1. Introduction

Organizational effectiveness or performance is the ultimate dependent variable in much organization and management research (Cameron & Whetten, 1983; March & Sutton, 1997). Discovering the independent variables that define effective and ineffective organizations is the major challenge for organizational evaluation (Cameron & Whetten, 1983). The conceptualization of organizational effectiveness has been very broad the last century resulting in three major approaches: goal-attainment approach, system(-resource) approach and multiple/strategic-constituencies approach (Carton, 2004; Glunk & Wilderom, 1996; Henri, 2003).

In the construction industry the same challenges are present when measuring the effectiveness of building project organizations. For instance, there are many recent articles that have taken on the more classical goal-attainment approach (Hale, Shrestha, Gibson, & Migliaccio, 2009; Raisbeck, Duffield, & Xu, 2010).

The purpose of this paper is to explore the different approaches used within literature concerning the construction industry. Based on a structured literature search in Scopus the main approaches applied within the industry are categorised and potential areas for further research are determined.

2. Overview of effectiveness constructs and models

As stated by (Cameron, 1986; Carton, 2004) and many other researchers, organizational effectiveness is a problem-driven and multi-dimensional construct. Constructs, by definition, have no objective referent. They are mental abstractions used by individuals to interpret their own reality (Cameron, 1986). This means that the criteria used to measure organizational effectiveness are based on the values and preferences of the individuals that participate in a research project. The search for the definition of organizational effectiveness is therefore infinite. However, several approaches have been developed to capture this construct the last few decades. Carton (2004) analysed eight different approaches and concluded that three primary constructs remained. These approaches are summarised in the following table (Table 1).

Table 1: The three primary approaches to capture the construct of organizational effectiveness (derived from: Carton, 2004, pp. 62-66)

Approach	*Conceptualization of the organization*	*Focus*	*References*
Goal attainment	*Organization as a rational set of arrangements oriented towards achieving goals*	*exclusively on the ends: achievement of goals, objectives, targets, etc.*	*(Etzioni, 1960)*
System resource	*Organization as an open system (input, transformation, output).*	*While not neglecting the importance of the ends, emphasizes the means needed for the achievement of specific ends in terms of inputs, acquisition of resources and processes*	*(Yuchtman & Seashore, 1967)*
Multiple/Strategic-constituencies	*Organization as internal and external constituencies that negotiate a complex set of constraints, goals and referents.*	*This model broadens the scope of the goal attainment and system resource models by adding the expectations of the various powerful (internal and external) interest groups that gravitate around the organization (owners, employees, customers, suppliers, creditors, community and government)*	*(Connolly, Conlon, & Deutsch, 1980)*

The different models will be further explained in the following paragraphs.

2.1 Goal attainment models

This approach relies on the vision of organizations as a set of rational set of agreements oriented toward the achievement of goals (Goodman & Pennings, 1977). These goals are mainly set by management. Effectiveness is measured in terms of accomplishment of outcomes (Etzioni, 1960). This approach rejects the premise that an organizational effectiveness construct can be universally defined or measured in terms of a static set of measures (Carton, 2004).

Since the 1960's, there is and has been a lot of criticism on the goal attainment approach. Ward, Curtis, and Chapman (1991) pointed out several weaknesses in using the goal approach for the evaluation of construction projects. One of them is the setting of objectives on an appropriate level. Apparent success in terms of meeting or exceeding an objective may just reflect an easily achieved objective (Ward, et al., 1991). Comparing PPP or D/B delivery methods with traditional methods based on the achievement of goals can also run into other fundamental problem: in a traditional setting the project goals are mainly defined unilaterally by the client or the clients representative, in a PPP or D/B setting the goals are often defined by the client and the main contractor together. Also, the performance can be affected by the external context. The application of the fairly new Design and Build contracts could, for example, have resulted in the assignment of more experienced project managers on the client as the contractors side. Other limitations of this approach are given by (Ghorpade, 1970). He states that multiple and even incompatible and implicit goals exist in organisations. Focussing on official or formal goals is misleading, for these goals are mostly incomplete or nothing more than window-dressing (Glunk & Wilderom, 1996). They can also vary over time and also in the degree in which they are being taken seriously by key members or stakeholders of the organisation (Tsui, 1990).

2.2 System (resource) models

This approach takes a system perspective. It stresses input, resources and processes over output variables. As stated in table 1, a system resource approach, while not neglecting the importance of the ends, emphasizes the means needed for the achievement of specific ends in terms of inputs, acquisition of resources and processes (Henri, 2003). By doing this, it focuses not only on the output variables (dependent variables), but also predicting variables (independent variables) of organizational effectiveness. This approach appears to be most useful in those organizations in which output goals are difficult to measure precisely, and when accurate input measures are available. When output measures are available, it also makes it possible to relate input, resources and process to outputs.

According to Carton (2004), the systems approach implies that performance is multi-dimensional, and must be examined using a set of measures simultaneously, which are appropriate to the population and phenomenon of interest, to allow for comparison across organizations. As with the goal attainment approach, this approach criticized for not taking into account for differences between stakeholders perceptions' on performance (Carton, 2004).

2.3 Multiple constituencies models

A multiple constituencies model broadens the scope of the goal attainment and system resource models by adding the expectations of the various stakeholders (internal and external) that are somehow connected to the organization (owners, employees, customers, suppliers, creditors, community and government); (Cameron & Whetten, 1996; Henri, 2003). While several variants

of this approach exist, the core of all variants is that an organization is effective to the extent that it satisfies the needs of various relevant organizational constituencies (Tsui, 1990).

According to Carton (2004), the key to using a multiple constituency approach is to determine what constituencies are present, what their view of effectiveness is, and the consequences of these assessments. From this evaluation, a set of performance criteria can be derived for each organization.

The two models previously described can both be seen from an constituency point of view. The goal attainment approach tends to reflect the perspective of owners and/or management. The system resource approach is more linked to important resources such as suppliers, subcontractors or personnel. The multiple constituencies model tries to integrate the multiple stakeholder viewpoints. This approach also inherits some of the problems of the earlier approaches, for instance the competing goals within an organization.

3. Models used within construction literature

To learn from other models that have been developed for the construction industry, a structured literature search was performed in Scopus on journal articles and reviews that were published since 2008.

3.1 Terminology used in structured search

In organisational and management studies, marketing, operations research, economics and other fields the word performance and effectiveness is widely used (Garvin, 1984; Neely, Gregory, & Platts, 1995). In these studies, semantically related terms to effectiveness such as performance, success(factors), efficiency, efficacy, satisfaction and quality are often employed. Some authors even use the terms interchangeably which contributes to a terminological confusion (Kanter & Brinkerhoff, 1981). What probably contributed to this confusion even more is that performance is an evolving concept (Pintea & Achim, 2010). For instance, at the beginning of the 20th century, following the machine analogy of organizations, the term ‘organizational effectiveness’ referred mainly to efficiency (i.e. technical efficiency). Changing conceptions of the organization also altered the notion of efficiency-as-effectiveness. Therefore, the structured search uses multiple synonyms to search for more or less the same aspects.

The keywords used in multiple searches are given in the following table.

Table 2: Aspects used in the Scopus and Web of science search

	Aspects *Combined with AND*				
Synonyms *Combined with OR*	*Aspect 1*	*Aspect 2*	*Aspect 3*	*Aspect 4*	*Aspect 5*
	Effectiveness	*Organi?ation**	*Compar**	*Indicator**	*Construction*
	Performance	*Project organi?ation*	*Benchmark**	*Measure**	*Building*
	Success	*Project delivery method**		*Metric*	
	Efficacy	*Project*		*Assess**	
	*? and * are wildcards used in the search*				

The search resulted in more than 184 hits in Scopus. Based on the title of the articles and the date of publication (2008 and later) the search was narrowed down. Thereafter, most relevant articles were selected based on the abstract and accessibility from the TU-Delft network and further analysed for this paper.

The models found are categorised in either goal-attainment models, system-resource models or multiple-constituencies models. From every model the main variables and scales are noted. The results are presented in the following paragraphs.

3.2 Goal attainment models

There are many articles that we found which present models that can be placed within the field of goal attainment models. (Raisbeck, et al., 2010) compared the performance of PPP with traditional procurement based on ratio scales on relative time and cost per stage and full construction period. (Hale, et al., 2009) compared Design/Build with Design/Bid/Build (traditional) delivery methods based on ratio scales on time and costs. (Minchin, Li, Issa, & Vargas, 2013) compares the performance of Design/Build and Design /Bid/Build delivery systems used by the Florida Department of Transportation. Based on ratio scales the cost estimate, award bid and final costs are compared. Duration was measured by looking at the original contract duration and final duration. Okunlola Ojo, Aina, and Yakeen Adeyemi (2011) compared 53 traditional contracts and 15 Design/Build projects. Time overruns, cost overruns are measured based on ratio scales. A 3 point Likert (ordinal) scale is used to measure satisfaction of the client with the standard of workmanship and specifications.

3.3 System resource models

Some articles that we found can be placed within the field of system resource models. Not surprisingly the main focus of these articles was on "project success factors".

Eriksson and Westerberg (2011) developed an holistic procurement framework that examines how a broad range of procurement related factors (process) effects project performance criteria (output). Based on a literature review Eriksson and Westerberg (2011) identified the following process variables: level of integration between client and contractors in de design stage, type of tendering, focus on soft parameters in bid evaluation, (joint) subcontractor selection, type of payment (incentives related to performance criteria), collaborative tools and the use of performance evaluation. The output variables that were identified are: cost, time, quality, environmental impact, work environment and innovation. In this paper no scales on which to measure the different variables are discussed.

Scott-Young and Samson (2008) developed "a comprehensive model of theoretically grounded project team variables and to explore its explanatory power for three key project outcomes (cost, schedule, and operability) in capital projects executed in the process industries". The resource and process variables contain cross-functional team, team experience, team continuity, co-location, virtual office setup, office designed for communication, project manager continuity, project manager incentives, problem solving, clear goals, senior management support, autonomous project structure and team potency. To measure these variables they used five item likert scale derived from other studies and team interviews. To measure output they measured cost, schedule and operability based on ratio scales.

Idoro (2012) compared Direct labour (DL) and Design/Bid/Build (DBB) delivery methods used in Nigeria. The objectives of his study "are to compare the levels of use of selected project plans, the levels of conception, design and construction planning and the outcome of projects procured by DL and DBB methods." The resource and process variables focus on the use of 14 different project documents that represent different forms of planning, based on an binary scale (0=not prepared, 1=prepared). The output variables are % time-overrun/initial contract period and % cost-overrun/initial contract sum (ratio scales). Based on a 3 point likert scale the clients assessment of project duration, cost and quality is measured.

3.4 Multiple-constituencies models

Some articles that we found can be placed within the field of multiple constituencies models. They can be divided in two groups.

Doloi, Iyer, and Sawhney (2011) examined the effectiveness of prequalification criteria in contractor selection from a successful project delivery perspective. The resource and process variables used by Doloi are technical expertise, relevant work experience, turnover fluctuations and successful past projects, defects liability attitude, plant maintenance programs, work

method statement, safety initiatives record, quality control and quality assurance programs. The output and outcome variables used by Doloi are, failure to comply with quality specifications, failure in on-time delivery, tender quality, tender timeliness, failure to perform safety requirements, past record of conflicts and disputes, on-time project delivery. All variables are measured on a 5 item Likert scale. Why one could see this model as a multiple constituencies model is that Doloi collected his data from senior management, project managers, contract administrators, head contractors, consultants and designers (97 responses in total). However, as many other studies do, all the different viewpoints are added together instead of viewing them separately. Examples of other studies which apply this same approach are Yeung, Chan, and Chan (2009) and Toor and Ogunlana (2010).

A study that does not aggregate all the different viewpoints has been performed by Lehtiranta, Kärnä, Junnonen, and Julin (2012). She used 580 evaluation reports representing 214 construction projects to evaluate the extent to which construction project participants' perception of each other's performance reflects on the owner's perception of project. The feedback question sets that are used in this research, i.e. the performance factors to be evaluated, are designed individually for each feedback flow. The variables are measured based on a five-point Likert scale. The variables are categorized in 5 main categories: project management, collaborative working, staff and skills, environment and safety, and finishing and handover. The main conclusion of this research is that "correlations were found between several relationships and the clients' view of project success suggests that multidirectional performance measurement within vertical and horizontal relationships would provide a useful source of information for deepening our understanding on the determinants of construction project success."

4. Conclusions and framework to develop

Based on the structured literature search it must be concluded that most research in the construction industry falls behind compared to general research on organizational effectiveness. Most models still applied within the industry can be dated back to the 1960s'; models that have been criticized ever since.

Furthermore, the findings of Lehtiranta, et al. (2012) show that the expectations of the various stakeholders should be accounted for and analyzed separately to deepen our understanding on the determinants of construction project success. This integrative perspective is provided by the multiple-constituencies approach to organizational effectiveness (Conolly, Colon, & Deutsch, 1980). This approach should be developed further for measuring the effectiveness of construction project organizations.

To do this, the three main approaches from the previous paragraph are combined into an input-process-output-outcome-context framework. In this framework the system resource approach is captured in the input, process and context measures. The goal attainment approach is captured

in the output, and the multiple constituencies approach is captured in the outcomes for the different stakeholders (inside and outside the project organization).

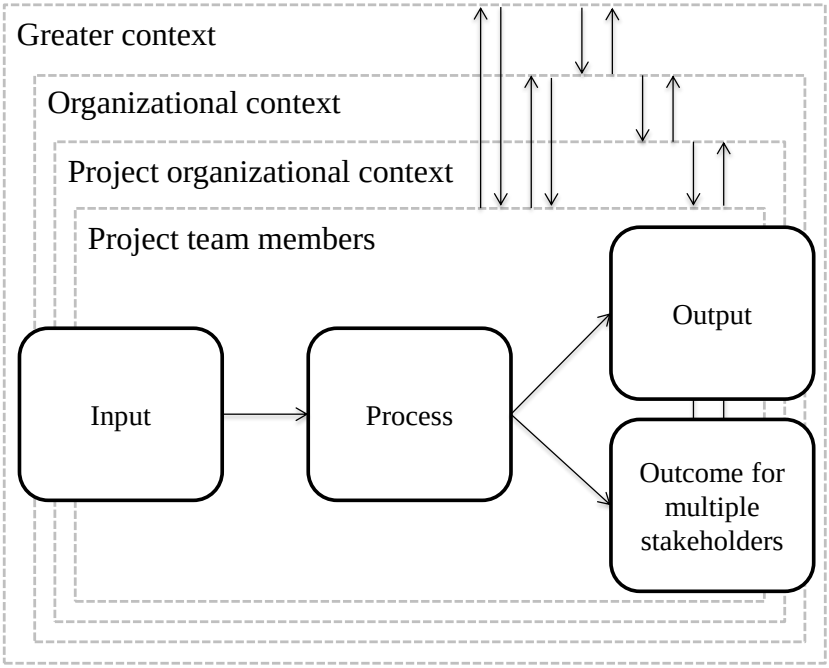

Figure 1: the IPOOC framework (own figure) for measuring construction project organization effectiveness

In general, input exists of items that go into the organisation, such as knowledge, human resources, technologies and materials. These inputs make it possible for the project organization to delivery output and outcomes. Processes represent several activities within the project organization which transform input into output. Output is mainly defined by the projects official goals in regard of time, quality, costs and even sustainability. Outcomes relate to the perception that critical internal and external stakeholders have concerning the project.

A similar framework that is commonly used in other research on (organizational) effectiveness is the input-process-output(-outcome) (I-P-O) (Mathieu, Maynard, Rapp, & Gilson, 2008). The reason why context is added to this framework is that construction project organizations have to operate in different contexts. Not only the context of the one organization, but also the context of different organizations and the greater context of the project surrounding. These different contexts can have a great influence on the project organization on multiple levels.

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