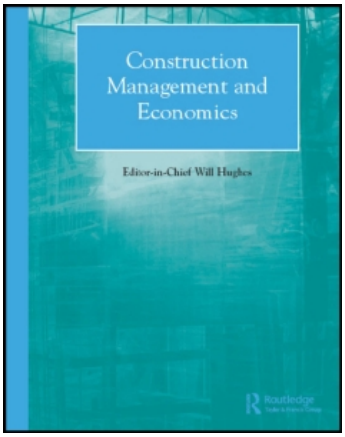

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Stakeholder impact analysis in construction project management

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Stakeholder impact analysis in construction project management

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Construction projects attract interest from various stakeholders who express needs and expectations about the project. These are often in conflict with each other and it is unlikely that all of them can be fulfilled. The stakeholder management process involves evaluating the needs and expectations of stakeholders in relation to the main objectives of the project. An important basis for this evaluation is stakeholder analysis. The approach is based upon established theory, knowledge of stakeholder management and empirical data. The analysis consists of a stakeholder impact index to determine the nature and impact of stakeholder influence, the probability of stakeholders exercising their influence and each stakeholder's position in relation to the project—are they proponents or opponents? The analysis of the stakeholder impact index can help project managers to formalize a stakeholder management process.

Keywords: Project management, project stakeholders, project strategies

Introduction

During the different stages of a construction project, from initiation to handover of completed construction, a vast number of interests will be affected, both positively and negatively. Representatives of these interests are referred to as the project's stakeholders. The stakeholders express needs and expectations about the project, which often conflict with one another, and it is unlikely that all stakeholder expectations will be met (McManus, 2002). Thus, the challenge for the construction project manager is to evaluate stakeholder needs and expectations in relation to the main objectives of the project in order to determine which needs and expectations are to be fulfilled. 'The ability to understand the often hidden power and influence of various stakeholders is a critical skill for successful project managers … Without attention to needs and expectations of a diverse range of stakeholders, a project will probably not be regarded as successful, even if the project manager was able to stay within the original time, budget and scope' (Bourne and Walker, 2005). Managers should attempt to identify their significant and legitimate stakeholders and to listen and respond to their interests and concerns (Post *et al.*, 2002). This management process is necessary in order to determine how the probable stakeholders are likely to react to project decisions, what influence their reaction will carry, and how the stakeholders might interact with each other and the project's managers and professionals to affect the chances for success of a proposed project strategy (Cleland, 1986).

Steuer (2006) sorts stakeholder theory into three different perspectives: corporate, stakeholder and conceptual. The corporate perspective deals with how corporations handle stakeholders, the stakeholder perspective analyses how stakeholders try to influence the organization and the conceptual perspective explores how particular concepts, such as common good or sustainable development, relate to business–stakeholder interactions. The purpose of this paper is to present a method for project stakeholder analysis from a stakeholder perspective. The method is constructed from established theory, knowledge of stakeholder management and from empirical data.

An important issue for the project management team is to identify and analyse those stakeholders who can have an influence over project decisions (Olander and Landin, 2005). This facilitates managing a process that maximizes stakeholder positive input and minimizes

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any detrimental or negative impact (Bourne and Walker, 2005). The analysis consists of a stakeholder impact index to determine the nature and impact of stakeholder influence, the probability of stakeholders using their influence, and each stakeholder's position in relation to the project—are they proponents or opponents?

Project stakeholders affect project management processes. It is therefore important to recognize the stakeholders in order to plan and execute a sufficiently rigorous stakeholder management process. The ambition of the study described here is to develop a stakeholder impact index as a tool for comprehensive project stakeholder analysis that can help project managers in planning and evaluating the stakeholder management process. The stakeholder impact index analyses the relative importance of different stakeholders and the nature of their potential impact.

Who are the stakeholders?

Freeman (1984) describes the concept of stakeholders as any group or individual who can affect, or is affected by, the achievement of a corporation's purpose. This definition is a development of the first stakeholder definition, which Freeman (1984) had traced back to a memo from Stanford Research Institute in 1963. The memo states that stakeholders are those groups without whose support the organization would cease to exist. In conclusion, Freeman (1984) states that the stakeholder approach is about groups and individuals who can affect the organization, and is about managerial behaviour taken in response to those groups and individuals. Phillips (2003) adds that stakeholder theory should be concerned with who has input in decision making as well as who benefits from the outcomes of such decision. Thus, for construction projects it is the responsibility of the project manager to respond to the needs and expectations addressed by the project's stakeholders and to be concerned with how the decision-making process is carried out.

There has been debate on how to define stakeholders. Freeman's (1984) definition, those that affect or are affected, is viewed as being broad, because it merits all to be stakeholders. If everyone is a stakeholder of everyone else there is little value-added in the use of the stakeholder concept (Phillips, 2003; Sternberg, 1997; and Mitchell *et al.*, 1997). The view expressed in the Stanford definition—those without whose support the organization would cease to exist—is regarded as narrow since relevant groups would be excluded. Post *et al.* (2002) state that the fundamental idea is for stakeholders to have a stake in the organization, and they define the stakeholders as those that contribute voluntarily or involuntarily to the organization's wealth-creating capacity and activities: they are, therefore, its potential beneficiaries and/or risk bearers. Donaldson and Preston (1995) identify stakeholders through the potential harms and benefits that they experience or anticipate experiencing as a result of the organization's actions or inactions.

Broad and narrow views can also be seen in the definitions of project stakeholders. PMI (2004) has basically adopted the Freeman (1984) definition and states that project stakeholders are individuals and organizations that are actively involved in the project or whose interests may be affected as a result of project execution or project completion. Thus, PMI (2004) suffers the same criticism as Freeman (1984) that all groups or individuals in some sense can be defined as stakeholders. McElroy and Mills (2000) adopt a narrower view much in line with Post *et al.* (2002). Project stakeholders are a person or group of people who have a vested interest in the success of a project and the environment within which the project operates. The term 'vested interest' can here be viewed as equal to the key term 'stake'. From Post *et al.* (2002), and Donaldson and Preston (1995), stake could be defined as actual or perceived benefits or risks/harms from organizational activities.

Donaldson and Preston (1995) draw a distinction between influencers and stakeholders. Some actors in the organization may have influence and a stake, some may only have a stake in the organization, while others may have influence only. Those actors that only have an influence are defined as influencers. Donaldson and Preston (1995) exemplify the media as typical influencers, and thus not as a stakeholder. Olander and Landin (2005) also define the media as not being a stakeholder, because it has no stake in the organization or the project. However, this view is problematic because it is evident that the media can have a tremendous impact on organizational and project activities.

Mitchell *et al.* (1997) address this problem. Even though influencers do not have legitimate claims or perhaps any claims at all, they do have power over an organization or project. Power and legitimacy are different and sometimes overlapping dimensions, so that theory of stakeholder identification must accommodate these differences. Thus, Mitchell *et al.* (1997) define power and legitimacy as core attributes in a comprehensive stakeholder identification model and add a dynamic attribute of urgency to complete that model. Classes of stakeholders can be identified by their possession of one, two or all three of the following attributes: the stakeholder's power to influence; the legitimacy of stakeholder relationships; and the urgency

of the stakeholder's claim (Mitchell *et al.*, 1997). Thus, a project stakeholder can be defined as a person or group of people who has a vested interest in the success of a project and the environment within which the project operates. Vested interest is defined as having possession of one or more of the stakeholder attributes of power, legitimacy or urgency. There are essentially two categories of stakeholder: internal stakeholders, who are those actively involved in project execution; and external stakeholders, who are those affected by the project.

Stakeholder attributes

A party to a relationship has power to the extent it has or can gain access to coercive, utilitarian or normative means to impose its will in the relationship (Mitchell *et al.*, 1997). The power of stakeholders may arise from their ability to mobilize social and political forces as well as their ability to withdraw resources from the organization (Post *et al.*, 2002). Government agencies and courts have a special kind of formal power. While they usually do not initiate action, they can serve as resolver of conflicts or as guarantor of due process (Freeman, 1984).

The central idea of legitimacy is understood in terms of normative legitimacy and derivative legitimacy (Phillips, 2003). Normative stakeholders are those to whom the organization has a moral obligation, an obligation of stakeholder fairness over and above that due to other social actors simply by virtue of being human. Derivatively legitimate stakeholders are those whose actions and claims must be accounted for by managers due to their potential effects upon normative stakeholders. Legitimacy is a social good, that is something larger and more shared than mere self-perception, and that may be defined and negotiated differently at various levels of social organization (Mitchell *et al.*, 1997). Legitimacy could, thus, be defined in terms of stakeholders that bear some sort of risk in relation to the organization, be it beneficial or harmful.

The importance of a stakeholder will depend on the needs of the organization and the extent to which the organization is dependent on that stakeholder, relative to other stakeholders, in meeting its needs. Therefore, at any given time, some stakeholders will be more important than others (Jawahar and McLaughlin, 2001). Concerns and priorities change over time; new classes and configurations of stakeholders appear in response to changing circumstances (Post *et al.*, 2002). Mitchell *et al.* (1997) argue that urgency is based on the following two attributes: time sensitivity, the degree to which managerial delay in attending to the claim or relationship is unacceptable to the stakeholder; and criticality, the importance of the claim or the relationship to the stakeholder. Urgency is defined as the degree to which claims call for immediate attention.

From the definition of stakeholder attributes, Mitchell *et al.* (1997) define different stakeholder classes that are dependent on the distribution of stakeholder attributes:

(1) Dormant stakeholders possess power to impose their will, but do not have any legitimate relationship or urgent claim. Their power remains unused.
(2) Discretionary stakeholders possess the attribute of legitimacy, but they have no power or urgent claim. There is no absolute pressure for managers to engage in an active relationship, although they may choose to do so.
(3) Demanding stakeholders possess an urgent claim, but have no power or legitimate relationship. This is bothersome, but does not warrant more than passing management attention.
(4) Dominant stakeholders are both powerful and legitimate. It seems clear that the expectations of any stakeholders perceived by managers to have power and legitimacy will matter.
(5) Dangerous stakeholders lack legitimacy, but possess power and urgency. They will be coercive and possibly violent, making the stakeholder 'dangerous'.
(6) Dependent stakeholders have urgent and legitimate claims, but possess no power. These stakeholders depend upon others for the power necessary to carry out their will.
(7) Definitive stakeholders are those that possess both power and legitimacy. They will already be members of an organization's dominant coalition. When such a stakeholder's claim is urgent, managers have a clear and immediate mandate to attend to and give priority to that claim.

Impact, probability and position

Johnson and Scholes (1999) state that it is not enough simply to identify stakeholders. Managers need to assess each stakeholder's interest to express its expectations on project decisions and if there is the power to follow it through. Johnson and Scholes (1999) propose a stakeholder mapping technique, the power/interest matrix, for this evaluation. In the power/interest matrix, project stakeholders can be categorized depending on their power towards the project and their level of interest (Olander and Landin, 2005; Winch and Bonke,

2002; Newcombe, 2003). Olander and Landin (2005) addressed the need to grade the two parameters, power and interest. However, it is hard to assess power on a scale, rather one assesses the impact each stakeholder has on the project. The interest level is in the same sense an assessment of the probability that a stakeholder will have an impact on project decisions. Thus, the assessment can, alternatively, be made by using the probability-impact analysis of risk assessment, see for example Ward and Chapman (2003), and change the power/interest matrix to the impact/probability matrix (see Figure 1).

Bourne and Walker (2005) develop this concept into the vested interest–impact index (ViII), which consists of the parameter vested interest levels (probability of impact), and influence impact levels (level of impact). The vested interest levels (v) and the influence impact levels (i) are qualitatively assessed as 5=very high, 4=high, 3=neutral, 2=low and 1=very low. The vested interest–impact index is then calculated as ViII=$\sqrt{}$(v*i/25) (Bourne and Walker, 2005).

Evaluating the total impact of stakeholders in relation to the project requires more than identifying the impact level and probability of impact. Project managers need to assess the stakeholder attributes and classes (Mitchell *et al.*, 1997), and their position towards the project (Cleland, 1986; Winch and Bonke, 2002)—are they opponents or proponents? McElroy and Mills (2000) propose five different levels of stakeholder position towards the project: active opposition, passive opposition, not committed, passive support and active support. The position that each stakeholder has towards the project sets the direction of the impact each stakeholder has on the project decision-making process. The concepts of impact, probability and position need to be valued together with stakeholder attributes. The stakeholder impact index introduces a valuation of the stakeholder attributes and position, which together with the vested interest index (Bourne and Walker, 2005) forms a tool for comprehensive stakeholder analysis.

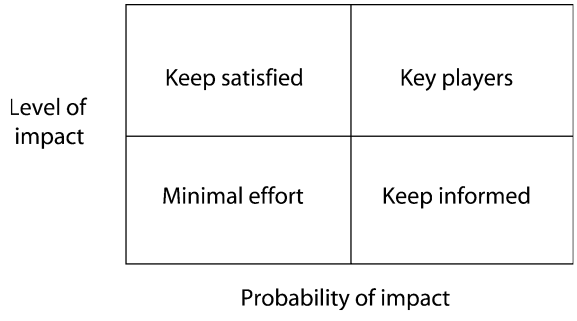

Figure 1 The stakeholder impact/probability matrix (adapted from Johnson and Scholes, 1999)

The stakeholder impact index

A case study of external stakeholders (those affected by project execution) has been conducted with the purpose of evaluating and understanding the external stakeholder management process within construction project management. Various documents, including newspaper articles, have been studied in combination with interviews of different stakeholders in construction projects, from project managers and local authorities to affected members of the public and special interest groups. From the study it was evident that construction projects affect, and are affected by, a vast number of stakeholders. The study was limited to external stakeholders, which means that the analysis here excludes internal stakeholders, for example the project owner, contractors and financial institutions.

Stakeholders are either proponents or opponents, and often use the power base of one stakeholder to enhance their own. From a project management perspective there is, thus, a need to understand, plan for and evaluate the impact that different stakeholders have on the project decision-making process. Bourne and Walker (2005) introduced the vested interest index which consists of the two parameters: vested interest level and influence impact level, which basically describe the level and probability of stakeholder impact on project execution. However, for a comprehensive stakeholder analysis the nature of the impact needs to be incorporated. Thus, the two concepts are added: the attribute value based on stakeholder classes (Mitchell *et al.*, 1997) and the position value based on the levels of stakeholder position proposed by McElroy and Mills (2000). When combining the stakeholder attribute value (A), and position value (Pos), with the vested interest–impact index (ViII), project managers can evaluate a stakeholder impact index (SII) as a function of A, Pos and ViII.

The stakeholder attribute value (A) is assessed with the help of weighing, where each attribute (power, legitimacy or urgency) is given a weight between 0 and 1, with the sum of the attribute weights as 1. The stakeholder attribute value will depend on the distribution of the three attributes (power (p), legitimacy (l) and urgency (u)) that each stakeholder possesses, showing the relative strength with respect to the project. The distribution of weights will vary from project to project. In this paper the weights have been determined as p=0.4, l=0.3 and u=0.3, because the empirical data implied that the attributes in general were roughly of equal importance, but power was slightly more important than the others. The vested interest–impact index (ViII) is valued as described by Bourne and Walker (2005). The position value (Pos) is

numerically assessed as: active opposition (Pos = −1), passive opposition (Pos = −0.5), not committed (Pos = 0), passive support (Pos = 0.5), and active support (Pos = 1). The stakeholder impact index can then be calculated as:

$$SII = ViII * A * Pos$$

The total stakeholder impact index for the project (SIIproj) is:

$$SIIproj = \Sigma SII_k,$$

where k = 1 to n number of stakeholders.

If SIIproj is positive the project has a favourable stakeholder impact, but if it is negative the stakeholder impact is unfavourable. Furthermore, a sufficient stakeholder management process should ensure an increasing SIIproj during the project's life cycle, or at least not one that decreases. From the studied cases presented below, three aspects will illustrate the use of the stakeholder impact index. A qualitative analysis has been performed where the input to the stakeholder impact index (SII) was based on empirical data and identified external stakeholders. Three basic evaluations have been undertaken and each has been for a different stage in the project in order to provide a basis for analysing the project over time. First, the level and probability of impact has been evaluated on a scale from 1 to 5 to calculate the vested impact index (ViII). Second, the attributes have been evaluated for each stakeholder during different stages of the project. Third, the position of each stakeholder has been evaluated based on how they have reacted to the implementation of the project during different stages. The analysis reveals external stakeholder impact on project implementation over time during the planning and design stages up to the permit to build. The projects are all located in the south of Sweden.

Stakeholder analysis for a construction project

Project 1: Housing for senior citizens consisting of 60 apartments

The project duration was 11 years, from 1988 to 1999, and the project had two distinct phases. The first phase was from 1988 to 1993 and consisted of two 9-storey buildings. This proposal was stopped because the permits to build were not granted, mainly because of influence from stakeholders who opposed the project and appealed against the municipal decision to grant it. In the second phase from 1994 to 1999, the project changed to consist of five 5–6 storey buildings, which were a less controversial proposal. In 1998 the permit to build was granted and construction on site began in the same year. The main concerns from opposing stakeholders were that the new development would negatively affect the living conditions of surrounding houses and that the site of the proposed development had some intrinsic cultural value.

Seven external stakeholder groups could be identified in the project:

- The municipality (grants local building permits in the formal planning process).
- The county administrative board (the first instance of appeals in the formal planning process).
- The national government (the last instance of appeals in the formal planning process).
- Residents in the vicinity (perceived themselves to be negatively affected by the project).
- Interest group for the preservation of the historical city image.
- Interest groups for senior citizens (spokesperson for the future tenants).
- The media.

Project 2: A civil engineering project consisting of the expansion of a single track railway into twin track through densely populated areas

The project's planning and design stage had a combined duration of 12 years, from 1991 to 2003, before the final permit to start construction on site was issued. Six of these years were non-value-adding time due to a long process of appeals against the municipality's decision to approve the project.

Eight external stakeholder groups could be identified in the project:

- The municipality (grants local building permits in the formal planning process).
- The county administrative board (the first instance of appeals in the formal planning process).
- The national government (the last instance of appeals in the formal planning process).
- Residents in the vicinity (perceived themselves to be negatively affected by the project).
- National Board of Housing (national body to which a proposed measure is referred for consideration and which raised concerns about the negative impacts on living conditions).
- Swedish Rescue Services Agency (national body to which a proposed measure is referred for consideration and which raised concerns about

the increased chance of accidents along the expanded railway).
- The railroad companies (the project was needed for them to maintain a sufficient level of public transport).
- The media.

Project 3: A housing project consisting of about 1,200 apartments

Unlike the other two projects this was subject to a relatively short process (from 2001 to 2003) for obtaining the necessary permit to start construcftion on site. This was due to strong political support from politicians in the municipality and the weak powerbase of opposing stakeholders. The main reason for opposition was that the number of people in the local community would double in a short period, which would then affect the level and quality of social services.

Six external stakeholder groups could be identified in the project:

- Politicians in the municipality (strongly supported the project and had the power to grant the permit to build).
- Planning officials in the municipality (did not believe that the project harmonized with the community as a whole and raised concerns about a potentially rapid increase in population).
- The local tenants' association (supported the project because of the need for rental apartments).
- Residents in the vicinity (concerned with the quality and level of social services in the local community).
- The local community board (did not feel that it could guarantee the quality and level of social services if the development were realized)
- The media.

The stakeholder analysis, the stakeholder impact index and the total project stakeholder impact index are presented in Tables 1 to 4. Table 1 shows the stakeholder analysis of the first phase of project 1. Depending on the controversy surrounding the proposed development many opposing stakeholders formed alliances to stop the project and ultimately managed to do so when the national government disapproved the municipal permit to start the proposed development. In the second phase (see Table 2), the real estate developer revised the proposal to be less controversial. The most opposing stakeholder—the residents in the vicinity—then lost their allies and thus their powerbase to stop the project.

Table 3 shows the development of project 2. In this project, the major opposing stakeholder (residents in the vicinity) established a protest group that actively tried to find alliances in order to stop or delay the project. The residents ultimately succeeded in delaying the project for six years through their active opposition, lack of interest on the part of the project managers in responding to criticism and support from other allies.

For project 3 (see Table 4), the negative impact of stakeholders was mainly limited to strong verbal opposition and critical press reports. The opposing stakeholders had no powerbase of their own as they did not have the formal right to appeal the municipal decision to approve, and the developer negotiated an agreement with those stakeholders who did have that right: this reduced the delays arising from appeals. This, in combination with a strong political support from the municipality to fast track the project, resulted in (from a project viewpoint) a limited negative impact from opposing stakeholders due mainly to the support of project proponents.

All the projects failed to acknowledge the concerns of opposing external stakeholders. In projects 1 and 2, this resulted in a prolonged and delayed planning and design process due to the combined powerbase of opposing stakeholders. Project 3 did not suffer long delays because of powerful proponents and weak opponents. In projects 1 and 2, the project manager was ultimately forced to acknowledge the concerns of external stakeholders, which to some extent resolved the problems initially raised by opponents. In project 3, this has not been the case. The problems raised by opposing stakeholders remain and are unresolved.

Discussion

The relative importance of different stakeholders depends on the possession of stakeholder attributes. From the stakeholder impact analysis above it is evident that power is the main attribute in order to affect the project's decision-making process. This is because power is a necessity in order to raise the impact level and has a strong influence on the project decision-making process. From a strict project perspective it can be argued that the stakeholders holding the attribute of power are the most relevant to consider in the stakeholder management process. However, the stakeholders that hold the attribute of legitimacy are in a sense more important, because they are the risk bearers in the project. Thus, it is more important, from a moral standpoint, to address the needs of the legitimate stakeholders fully. If not, they may try to achieve a powerbase by themselves or by forming an alliance with

Table 1 Stakeholder analysis for project 1, phase 1

Feasibility and conceptual design stage (project 1:1)										
Stakeholders	Attributes			Class	Stakeholder Value Index					
	Pow	Leg	Urg		A	v	i	Pos	ViII	SII
The Municipality	0.4	0.3		Dominant	0.7	2	2	0.5	0.40	0.14
The County Administrative Board	0.4			Dormant	0.4	3	1	0	0.35	0.00
The National Government	0.4			Dormant	0.4	3	1	0	0.35	0.00
Residents in the vicinity		0.3	0.3	Dependent	0.6	1	4	−1	0.40	−0.24
Interest group for the preservation of the city image	0.4			Dormant	0.4	3	3	−0.5	0.60	−0.12
Interest group for senior citizens		0.3		Discretionary	0.3	1	4	0.5	0.40	0.06
The media	0.4			Dormant	0.4	3	3	0	0.60	0.00
Project Stakeholder Value	−0.16									

Formal planning stage (project 1:1)										
Stakeholders	Attributes			Class	Stakeholder Value Index					
	Pow	Leg	Urg		A	v	i	Pos	ViII	SII
The Municipality	0.4	0.3	0.3	Definitive	1	5	4	0.5	0.89	0.45
The County Administrative Board	0.4			Dormant	0.4	3	1	0	0.35	0.00
The National Government	0.4			Dormant	0.4	3	1	0	0.35	0.00
Residents in the vicinity		0.3	0.3	Dependent	0.6	2	5	−1	0.63	−0.38
Interest group for the preservation of the city image	0.4		0.3	Dangerous	0.7	3	4	−1	0.69	−0.48
Interest group for senior citizens		0.3	0.3	Dependent	0.6	1	4	1	0.40	0.24
The media	0.4		0.3	Dangerous	0.7	4	4	−0.5	0.80	−0.28
Project Stakeholder Value	−0.46									

Stage of appeals (project 1:1)										
Stakeholders	Attributes			Class	Stakeholder Value Index					
	Pow	Leg	Urg		A	v	i	Pos	ViII	SII
The Municipality		0.3	0.3	Dependent	0.6	3	5	1	0.77	0.46
The County Administrative Board	0.4	0.3		Dominant	0.7	5	2	0.5	0.63	0.22
The National Government	0.4	0.3		Dominant	0.7	5	3	−0.5	0.77	−0.27
Residents in the vicinity	0.4	0.3	0.3	Definitive	1	4	5	−1	0.89	−0.89
Interest group for the preservation of the city image	0.4		0.3	Dangerous	0.7	3	3	−1	0.60	−0.42
Interest group for senior citizens		0.3		Discretionary	0.3	1	1	−0.5	0.20	−0.03
The media	0.4		0.3	Dangerous	0.7	4	4	−0.5	0.80	−0.28
Project Stakeholder Value	−1.21									

more powerful stakeholders. In either case, the project manager loses control over the stakeholder management process.

From the stakeholder impact analysis, the project manager can establish a stakeholder management process. The stakeholder management process can be divided into three different parts depending on which attributes the stakeholders possess. To the legitimate stakeholders there is a moral obligation to include their interest in the decision-making process. There is a necessary obligation to the powerful stakeholders, who must be monitored in the stakeholder management process in order to proactively manage the potential impact that they may have. Finally, there is a timely obligation to attend to the needs of the urgent stakeholders. Thus, depending on the possession of stakeholder attributes the project management has a moral, necessary or timely obligation towards the stakeholders. These obligations will consequently be combined for those stakeholders that possess two or

Table 2 Stakeholder analysis for project 1, phase 2

Feasibility and conceptual design stage (project 1:2)										
Stakeholders	Attributes			Class	Stakeholder Value Index					
	Pow	Leg	Urg		A	v	i	Pos	ViII	SII
The Municipality		0.3	0.3	Dependent	0.6	3	4	1	0.69	0.42
The County Administrative Board	0.4			Dormant	0.4	3	1	0	0.35	0.00
The National Government	0.4			Dormant	0.4	3	1	0	0.35	0.00
Residents in the vicinity		0.3	0.3	Dependent	0.6	1	5	−1	0.45	−0.27
Interest group for the preservation of the city image	0.4			Dormant	0.4	2	2	−0.5	0.40	−0.08
Interest group for senior citizens		0.3		Discretionary	0.3	1	1	0.5	0.20	0.03
The media	0.4			Dormant	0.4	3	3	−0.5	0.60	−0.12
Project Stakeholder Value	−0.02									

Formal planning stage (project 1:2)										
Stakeholders	Attributes			Class	Stakeholder Value Index					
	Pow	Leg	Urg		A	v	i	Pos	ViII	SII
The Municipality	0.4	0.3	0.3	Definitive	1	5	4	1	0.89	0.89
The County Administrative Board	0.4			Dormant	0.4	3	1	0	0.35	0.00
The National Government	0.4			Dormant	0.4	3	1	0	0.35	0.00
Residents in the vicinity		0.3	0.3	Dependent	0.6	1	5	−1	0.45	−0.27
Interest group for the preservation of the city image	0.4			Dormant	0.4	2	2	0	0.40	0.00
Interest group for senior citizens		0.3	0.3	Dependent	0.6	1	4	1	0.40	0.24
The media	0.4			Dormant	0.4	3	3	−0.5	0.60	−0.12
Project Stakeholder Value	0.75									

Stage of appeals (project 1:2)										
Stakeholders	Attributes			Class	Stakeholder Value Index					
	Pow	Leg	Urg		A	v	i	Pos	ViII	SII
The Municipality		0.3	0.3	Dependent	0.6	3	3	1	0.60	0.36
The County Administrative Board	0.4	0.3		Dominant	0.7	5	3	0.5	0.77	0.27
The National Government	0.4	0.3		Dominant	0.7	5	3	0.5	0.77	0.27
Residents in the vicinity	0.4	0.3	0.3	Definitive	1	3	5	−1	0.77	−0.77
Interest group for the preservation of the city image	0.4			Dangerous	0.4	1	1	0	0.20	0.00
Interest group for senior citizens		0.3		Discretionary	0.3	1	1	−0.5	0.20	−0.03
The media	0.4			Dormant	0.4	3	3	0	0.60	0.00
Project Stakeholder Value	0.10									

more attributes. To the definitive stakeholders, the project manager has all of the obligations (moral, necessary and timely). Stakeholder attributes are the basis of the stakeholder analysis and define the obligations that the project manager has towards stakeholders. For a comprehensive stakeholder analysis there is, however, a need to analyse the probable impact of different stakeholders and their position towards the project. The stakeholder impact index combines all these aspects into one analysis. Thus, it is possible to formalize a project stakeholder management process from knowledge of both the project's obligation to each stakeholder, and the potential impact from each stakeholder on the project decision-making process.

Conclusions

Stakeholder analysis based on the stakeholder impact index can be used as a planning and as an evaluation tool. As a planning tool, it can be used proactively to structure the project stakeholders and their potential

Table 3 Stakeholder analysis for project 2

Feasibility and conceptual design stage (project 2)										
Stakeholders	Attributes			Class	Stakeholder Value Index					
	Pow	Leg	Urg		A	v	i	Pos	ViII	SII
The Municipality		0.3		Discretionary	0.3	2	2	0.5	0.40	0.06
The County Administrative Board	0.4			Dormant	0.4	3	1	0	0.35	0.00
The National Government	0.4			Dormant	0.4	3	1	0	0.35	0.00
Residents in the vicinity		0.3		Discretionary	0.3	1	3	−0.5	0.35	−0.05
National Board of Housing	0.4			Dormant	0.4	1	1	0	0.20	0.00
Swedish Rescue Services	0.4			Dormant	0.4	1	1	0	0.20	0.00
Railroad companies	0.4	0.3	0.3	Definitive	1	3	5	1	0.77	0.77
The media	0.4			Dormant	0.4	3	3	0	0.60	0.00
Project Stakeholder Value	0.78									

Formal planning stage (project 2)										
Stakeholders	Attributes			Class	Stakeholder Value Index					
	Pow	Leg	Urg		A	v	i	Pos	ViII	SII
The Municipality	0.4	0.3	0.3	Definitive	1	5	4	0.5	0.89	0.45
The County Administrative Board	0.4			Dormant	0.4	3	1	0	0.35	0.00
The National Government	0.4			Dormant	0.4	3	1	0	0.35	0.00
Residents in the vicinity		0.3	0.3	Dependent	0.6	2	5	−1	0.63	−0.38
National Board of Housing	0.4			Dormant	0.4	2	2	0	0.40	0.00
Swedish Rescue Services	0.4			Dormant	0.4	1	1	0	0.20	0.00
Railroad companies		0.3	0.3	Dependent	0.6	2	5	1	0.63	0.38
The media	0.4		0.3	Dangerous	0.7	5	5	−0.5	1.00	−0.35
Project Stakeholder Value	0.10									

Stage of appeals (project 2)										
Stakeholders	Attributes			Class	Stakeholder Value Index					
	Pow	Leg	Urg		A	v	i	Pos	ViII	SII
The Municipality		0.3	0.3	Dependent	0.6	2	3	1	0.49	0.29
The County Administrative Board	0.4	0.3		Dominant	0.7	5	2	0.5	0.63	0.22
The National Government	0.4	0.3		Dominant	0.7	5	1	−0.5	0.45	−0.16
Residents in the vicinity	0.4	0.3	0.3	Definitive	1	3	5	−1	0.77	−0.77
National Board of Housing	0.4			Dormant	0.4	5	3	−0.5	0.77	−0.15
Swedish Rescue Services	0.4			Dormant	0.4	5	3	−0.5	0.77	−0.15
Railroad companies		0.3	0.3	Discretionary	0.6	1	1	0.5	0.20	0.06
The media	0.4			Dormant	0.4	4	4	−0.5	0.80	−0.16
Project Stakeholder Value	−0.83									

impact on the project. As an evaluation tool, it can be used to evaluate the stakeholder management process during the project and after project completion. During the project it is important to follow up the stakeholder management process, because stakeholder impact is dynamic and changes over time. After project completion an evaluation of the stakeholder management process is necessary to transfer knowledge to forthcoming projects. Additionally, it can be used as one criterion among others (e.g. investment cost, environmental impact and life cycle analysis) in a multi-criteria analysis, when choosing between alternative solutions for the project.

The stakeholder analysis presented here is, however, of a qualitative nature, which means that it will never be better than the input made by the project manager or other agencies. However, if this input is thoroughly considered the stakeholder impact index (SII) will help project managers to structure stakeholder analysis in order to plan a course of action for the project. Before each major decision in the project, a stakeholder analysis should be conducted in order to obtain

Table 4 Stakeholder analysis for project 3

Feasibility and conceptual design stage (project 3)

Stakeholders	Attributes			Class	Stakeholder Value Index					
	Pow	Leg	Urg		A	v	i	Pos	ViII	SII
Politicians in the municipality	0.4	0.3	0.3	Definitive	1	5	5	1	1.00	1.00
Planning officials		0.3		Discretionary	0.3	1	3	−0.5	0.35	−0.05
Residents in the vicinity		0.3		Dependent	0.3	1	3	−0.5	0.35	−0.05
Local coomunity board		0.3		Discretionary	0.3	2	2	0	0.40	0.00
Local tenants association	0.4			Dormant	0.4	3	3	0.5	0.60	0.12
The media	0.4			Dormant	0.4	1	1	0	0.20	0.00
Project Stakeholder Value	1.02									

Formal planning stage (project 3)

Stakeholders	Attributes			Class	Stakeholder Value Index					
	Pow	Leg	Urg		A	v	i	Pos	ViII	SII
Politicians in the municipality	0.4	0.3	0.3	Definitive	1	5	5	1	1.00	1.00
Planning officials	0.4	0.3	0.3	Definitive	1	3	4	−1	0.69	−0.69
Residents in the vicinity		0.3	0.3	Dependent	0.6	1	4	−1	0.40	−0.24
Local coomunity board	0.4	0.3		Dominant	0.7	3	3	−0.5	0.60	−0.21
Local tenants association	0.4			Dormant	0.4	3	4	1	0.69	0.28
The media	0.4			Dormant	0.4	3	4	−0.5	0.69	−0.14
Project Stakeholder Value	0.00									

Stage of appeals (project 3)

Stakeholders	Attributes			Class	Stakeholder Value Index					
	Pow	Leg	Urg		A	v	i	Pos	ViII	SII
Politicians in the municipality	0.4	0.3	0.3	Dependent	1	2	5	1	0.63	0.63
Planning officials		0.3		Discretionary	0.3	2	3	−0.5	0.49	−0.07
Residents in the vicinity		0.3		Discretionary	0.3	2	5	−1	0.63	−0.19
Local coomunity board		0.3		Discretionary	0.3	3	4	−0.5	0.69	−0.10
Local tenants association		0.3		Discretionary	0.3	2	3	0.5	0.49	0.07
The media	0.4			Dormant	0.4	3	4	0.5	0.69	0.14
Project Stakeholder Value	0.48									

feedback on how alternative ways to proceed will affect the positive input and negative impact from project stakeholders. This can be exemplified by the public involvement in the studied cases. In none of the cases did the project managers involve the affected public in the early stages of the project. The effect of this was that the project mangers were forced to react to the concerns from the affected public instead of proactively address these concerns in their decision-making process. The result was a stigmatized and confrontational process between the developer and the affected public that opposed the project, which could have been less severe if an analysis with for example the stakeholder impact index had been made.

Further research is needed to examine and evaluate the application of the stakeholder impact index in construction project management across different stages and levels of project execution with internal as well as external stakeholders. Additionally, a sensitivity analysis of how the weighted distribution of stakeholder attribute value will affect the analysis and the conclusions drawn from it should be undertaken.

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