How to assess stakeholders' influence in project management?
A proposal based on the Analytic Network Process

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Abstract

In this paper we present a methodology to measure stakeholders' influences within a project from the point of view of the Project Manager. It is a novel proposal for the definition of "influence" among stakeholders based on a multiperspective approach.

The concept of influence is broken down into criteria, evaluating different aspects that together define an index which measures the influence of each stakeholder with respect to the rest of the project team. This index is calculated with the Analytic Network Process.

The methodology has been applied to a maintenance project for the Spanish National Railway Infrastructure company. Results show that the most influential stakeholders are the Contractor and the Signaling systems provider accounting for 40% of the total influence.

These results have helped the Project Manager to be aware of the two most influential stakeholders and set the guidelines for the stakeholder management in the future.

1. Introduction

The International Project Management Association (IPMA) defines project management success as "*the appreciation by the various interested parties of the project outcomes*", the interested parties[1] being "*people or groups who are interested in the performance and/or success of the project, or who are constrained by the project*" (IPMA, 2006). The Project Management Institute (PMI) defines stakeholder "*as an individual, group, or organization who may affect, be affected by, or perceived itself to be affected by a decision, activity or outcome of a project. Stakeholders may be actively involved in the project or have interests that may be positively or negatively affected by the performance or completion of the project*" (PMI, 2013). ISO 21500:2012 suggests the relevance of a detailed analysis of stakeholders and their impact on the project.

These two important project management associations in the world recognize that it is essential that project managers pay close attention to stakeholders. Beringer et al. (2013) say that both research and practice suggest that stakeholders play a crucial role in the successful management of projects. The ability to understand the often hidden power and influence of various stakeholders is a critical skill for successful project managers (Bourne and Walker, 2005). In fact, stakeholder management is one of the ten knowledge areas recognized by PMI. One of the questions of this area is "*how the stakeholders are able to influence the project management*". According to Aaltonen and Kujala (2010) this question has not properly been

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  [1] Instead of using the term "interested parties" the term "stakeholder" is the most commonly used in the literature (in fact, IPMA considers both words as synonyms). For this reason, in this work, we will use the word "stakeholder".

addressed in the literature. Answering this question is not an easy task because there are different points of view to define the concept of "influence the project management" and different strategies stakeholders can use to influence the project (Aaltonen et al., 2008).

In this paper we want to shed some light to this particular issue and propose a new method to measure the influence that stakeholders exert on project management. The aim is to provide an individual influence index for each stakeholder analyzing the concept of influence from a multiperspective point of view based on Multicriteria Decision Aid (MCDA) techniques.

MCDA describes a number of formal approaches which seek to take explicit account of multiple criteria in helping individuals or groups explore decisions that matter (Belton and Stewart, 2002). MCDA concepts and methods have been largely studied in the Operational Research literature (Figueira et al., 2005; Ishizaka and Nemery, 2013). Most of the MCDA techniques work well under the assumption of judgmental independence of criteria. However, this assumption is not always realistic, particularly when analyzing the influence relationships among stakeholders. From all the MCDA techniques the Analytic Network Process (Saaty, 2001) has been chosen because it is the only one that takes into account the interdependency of all the elements of the network, that is, the way that they influence each other.

As far as we know, ANP has never been applied to analyze the influence between stakeholders. This is not an easy task because the stakeholder network can be modeled in different ways. The main problem that we now have to face is how to define the concept "influence" in a specific stakeholders' network.

Therefore, the main questions that we try to answer in this work are 'from the point of view of the Project Manager: i) Which is the individual influence of each stakeholder on the project and ii) how can we measure it?'

The rest of the paper is organized as follows: Section 2 presents a literature review in the field of stakeholders' management; Section 3 describes the ANP stakeholder analysis; Section 4 presents its application to a case study and finally Section 5 draws some conclusions of our work.

2. Literature review

Identifying project success factors and the different perceptions of these factors by stakeholders has been extensively studied in the Project Management literature and remains a matter of debate (Davis, 2014). Yang et al. (2011) suggest that stakeholder involvement is important to project outcomes. Aaltonen and Sivonen (2009) argue that stakeholder related conflicts and incidents are among the most significant unforeseen risks in projects implemented in challenging environments.

The stakeholder theory is becoming an important approach in project management (Littau et al., 2010). These authors place the birth of the stakeholder theory after the publication of the book "Strategic management: A stakeholder approach" (Freeman, 1984). Since then, interest in analyzing how stakeholders (individuals, groups or organizations) influence management and decision-making processes has grown significantly, as it is shown in the literature, (Freeman et al., 2010; Bryson, 2004) as well as in more specific areas, for example, policy and health care management (Brugha and Varvasovszky, 2000), environmental management (Reed et al., 2009) or project management (Yang et al., 2011; Davis, 2014; Mok et al., 2015).

According to PMI (2013) Project Stakeholder Management includes the processes required (i) to identify stakeholders, (ii) to analyze stakeholders' expectations and their impact on the project, and (iii) to develop strategies for effectively engaging stakeholders in project decisions and execution. The process of identifying stakeholders is closely related to the analysis of their influence and potential impact on project success. Some of the works in the literature which study this particular process analyze the relationship of the stakeholders to the success of the project (Achterkamp and Vos, 2008), the types of strategies stakeholders have attempted to increase their salience and affect project outcomes (Aaltonen et al., 2008), or the strategies of response to the demands and pressures of the stakeholders (Aaltonen and Sivonen, 2009).

Other works have proposed tools for identifying and managing stakeholders. According to Bourne and Weaver (2010) there are three basic approaches used to help and visualize, map and understand stakeholders: customer relationship management (CRM), techniques for listing and mapping stakeholders and their influence, and social networks. CRM is used in business management and requires a large amount of data on large groups of stakeholders (usually customer segments). It uses techniques based on data mining and does not apply in project management.

Techniques for listing and mapping stakeholders are very simple and intuitive to use and therefore they are widely used in project management (PMI, 2013). One of the most well-known models for stakeholders' identification and prioritization in business management (steps (i) and (ii)) is the theory of stakeholder identification and salience proposed by Mitchell et al. (1997). These authors suggested to classify stakeholders in terms of three attributes: power to influence the firm, legitimacy of the stakeholder's relationship with the firm and the urgency of the stakeholder's claim on the firm. Based on these three attributes Mitchell et al. (1997) tried to explain how managers prioritize stakeholder relationships. Based on this model they also proposed some techniques that used the graphical representation of the types of stakeholders through pairwise matrices that combine the following dimensions: power, support, influence, interest, and attitude. Examples of practical use of power/interest matrices can be found in Gardner et al. (1986) or Olander and Landin (2005). A more complete review of these techniques can be found in Bourne and Weaver (2010) and Reed and Curzon (2015).

The above-mentioned techniques are based on the qualitative analysis of the dimensions cited. In an attempt to perform a quantitative analysis, Bourne and Walker (2005) proposed the *vested interest-impact index* (ViII) that assesses the potential impact of each stakeholder interest on project execution. This