Identification and Time-series Evaluation of Stakeholders: A Strategic Approach for Stakeholder Management

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Abstract. Project stakeholders greatly influence the success and failure of a project and its management activities. Even ISO21500:2012 emphasizes stakeholder management by project participants, though it does elaborate on the methods and techniques. Ikeda and Seki (2014) provide a strategic approach and an idea for a time-series analysis of changes in project stakeholders' interests and behavior based on a risk analysis technique proposed by Kado et al. (2001, 2003) that uses the FMECA worksheet. This study adopts Ikeda and Seki (2014) and Kado et al.'s (2001, 2003) approaches and proposes an integrated approach to identify and evaluate project stakeholders and visualize changes in their interests and behavior in project activities depending on the project progress. This proposal employs standard project analysis and tools and techniques, and is thus easy to implement during the project management process.

Keywords: Stakeholder Analysis, Stakeholder Mapping, Salience Model

1. INTRODUCTION

According to Freeman (1984), while it is difficult to track down the precise origins of stakeholder management, Freeman (1963) first used the term "stakeholder" in an internal memorandum at the Stanford Research Institute. The original is no longer available, Freeman and Reed (1983) defined the term originally as, "those groups without whose support the origination would cease to exist." The related work in the Stanford Research Institute in the 1960s describes the concept of stakeholders and its related fields of corporate planning, systems theory, corporate social responsibility, and organization theory. Nowadays, stakeholder and stakeholder management are an important aspect of organizational management for all sorts of profit and nonprofit organizations.

In the field of project management, stakeholder and stakeholder management are key factors to manage a successful project, though this was only part of the broader discussion of project communication management before the establishment of ISO 21500:2012(2012). This is the first ISO document related to portfolio, program, and project management, which provided the first opportunity to discuss the topic independent of other knowledge areas. In a recent study of project stakeholder management, Mok, Shen, and Yang (2015) review articles in the field of mega-construction project management and introduce many related works, such as Jones (1995) categorization of stakeholder theory; Mitchell, Agle, and Wood's (1997) discussion of stakeholder salience and typology; and Noland and Phillips's (2010) study of stakeholder engagement.

On the other hand, stakeholders greatly influence the success and failure of information system (IS) development projects depend, though this area does not have enough discussion about stakeholder management. Inoue (2011) pointed out that, "Stakeholder management is the most difficult subject in project management." Software Life Cycle Process (SLCP) 2013 (IPA, 2013), a modified edition of ISO/IEC 12207: 2008 for Japanese IS vendors, indicates that, "As introducing the open architecture and the networking functions to recent IS, the numbers and kinds of stakeholder have increased." This standard changed and extended the scope of stakeholders in IS development.

Generally, developing an excellent IS requires close cooperation among stakeholders, each serving their corresponding role and fulfilling their responsibilities.

Most Japanese IS vendors develop and perform their own

project stakeholder management as a part of the overall project communication management based on PMBOK Guide (2008).

As a background to these enterprise approaches and the recent strong interest in stakeholder management, companies use project stakeholder management as an independent knowledge area to ensure the success of project, such as ISO 21500:2012 (2012).

The general project management process outlined in guides such as PMBOK Guide and ISO 21500:2012 employ a PDCA cycle that often uses different keywords such as plan, implement, and monitor and control to express the project management process. Many use this basic management process for the overall project management process and to manage stakeholders without exception. According to this process, stakeholders are managed courteously, while the planning phase includes identification and registration, analysis, and planning responses. On the other hand, unpredictable stakeholders often appear during the implementation phase of a project, and each stakeholder's power and interests change depending on the progress of the development phase. There is a simple contradiction between stated project stakeholder management and its practices.

Project stakeholders sometimes create critical risks depending on the management and/or development process of a project.

According to the general characteristics of a project, called progressive elaboration, it is easy to understand existing unpredictable stakeholders in the early stages of a project. Therefore, strategic scenarios to respond to stakeholders at the early stage are sometimes incomplete, and this fact often leads to tactical responses to stakeholders' unpredictable activities in the implementation phase of a project.

This paper proposes a strategic approach for project stakeholder management that considers project stakeholders' interests and behavior changes. The next section summarizes the elements of Ikeda and Seki (2014) and reviews previous stakeholder studies and those in related areas as the basis of this study. The third section describes the proposal, which includes identification, characterization, and evaluation of stakeholders to prepare for a visualization of stakeholders' interests and behavior. The fourth section presents the process to visualize project stakeholders' interests and behavior. The final section provides this study's conclusions.

2. PRIOR STUDIES

For a successful project, managers should identify a more comprehensive set of stakeholders, both in meaning and number, through an organizational and systematic approach regardless of the maturity levels of each project team. The first step is to identify and register the project stakeholders in a stakeholder list.

In this stakeholder list, all project stakeholders should be identified and listed along with their characteristics.

To provide the main functions of the stakeholder list, Ikeda and Seki (2014) employs the FMECA worksheet. The worksheet should include the organizational and systematic support function to identify and qualitatively evaluate project stakeholders. This function should provide an organizational learning opportunity for project stakeholder management.

FMECA is an abbreviation for Failure Mode, Effects and Criticality Analysis. This method is an extension of Failure Mode and Effects Analysis (FMEA), and is a well-known analytical method in safety engineering and reliability engineering. Applying this method, problems arising from the result of product design and engineering design are analyzed and ordered by levels of impact and criticality of the failure mode. Using this method at the design stage, the potential problems in the implementation stage are declared, and the result is reflected in the process of reviewing the design. Earlier studies sometimes apply FMECA to an analysis of project risks (e.g., Kado et al., 2001, 2003).

According to some prior studies, a quantitative analysis of project stakeholders is generally very difficult, and these studies do not consider the influences of impact changes by time-series. Ikeda and Seki's (2014) study applies Kado et al.'s (2001, 2003) proposal for project risk management to a project stakeholder analysis.

Figure 1 shows a worksheet for a project stakeholder analysis as proposed by Ikeda and Seki (2014) using the FMECA worksheet. Ikeda and Seki's (2014) study revises the FMECA worksheet and proposes a stakeholder identification and evaluation procedure. To construct an area to identify and characterize each project stakeholder, the first column of the standard FMECA worksheet *Failure Mode* is changed to *Stakeholder*, and new columns are added: *Explicit Phase* of the stakeholder, *Role* of the stakeholder, *Interest* in project phases, and the status of outputs and

Name	Explicit Phase	Role	Interest	Dormant: X			Demanding: Y			Discretionary: Z			Total Evaluation : X+Y+Z
				Levels of Impact: a	Levels of Explicit: b	Evaluation: c	Levels of Impact: a	Levels of Explicit: b	Evaluation: c	Levels of Impact: a	Levels of Explicit: b	Evaluation: c	

Figure 1: Modified FMECA Worksheet for Project Stakeholder Analysis (Ikeda and Seki, 2014)

deliverables. Furthermore, to analyze and evaluate each project stakeholder, the worksheet also includes the items *Dormant*, *Demanding,* and *Discretionary*.

Some symbols that describe each development phase of a project should be added to the *Explicit Phase* column. A stakeholder may relate to all project activities, from initiation to closing; on the other hand, another stakeholder may appear in the second phase halfway through the project and lose influence before the closing phase. The worksheet contains a supplementary table to store a description of each stakeholder's behavior.

Ikeda and Seki's (2014) proposal provides this modified FMECA worksheet, some supplementary tables to complete this worksheet, and a method to visualize project stakeholders' behaviors.

3. NEW APPROACH TO IDENTIFY AND EVALUATE STAKEHOLDERS

3.1 Identification

Figure 2 illustrates this study's project stakeholder identification process, which uses four aspects to determine the project's stakeholders. This approach uses ideas from WBS, the salience model, RACI chart, and project experience to compose a systematic and learnable approach to identify project stakeholders. The first aspect comes from WBS, which provides some information about project activities that indicate real participants' names and roles in the project. The second aspect uses the salience model (Mitchell et al., 1997), which is a well-known project stakeholder mapping tool. The major elements of *Dormant*, *Discretionary*, and *Demanding* are related to the typical stakeholders' behaviors *Power*, *Legitimacy* and *Urgently*, respectively. These three elements characterize each project stakeholder and can suggest project stakeholders. The third aspect is from the RACI chart, which is typically used with WBS and OBS and indicates responses from each project participant. In this proposal, the RACI chart will be a tool that suggests project stakeholders according to keywords in responsibilities. The final aspect is organizational and individual project experience for all-round project implementation and management. This approach is sometimes a top-down approach, but the major stakeholders are certainly introduced in the process of identifying a project's stakeholders.

3.2 Evaluation

Figure 3 shows the table to analyze project stakeholders, which is a modified form of Figure 1 as proposed by Ikeda and Seki (2014) based on the FMECA worksheet. Both proposals use the salience model to characterize each project stakeholder. In Figure 1, three elements of salience model and impact and probability analysis are combined, and the score for *Levels of Impact* (a) and *Levels of Explicit* (b) are used to calculate *Evaluation* (c), which is *a* multiplied by *b*. The score c for the three elements of the salience model, *Dormant* (X), *Discretionary* (Y), and *Demanding* (Z) are used for the score of *Total Evaluation* as the total value of *c*. It should be noted that this proposes uses only two characteristics of project stakeholders: *Explicit Phase* and *Interest*. The table contains an item called *Role*, but this is just an attribute of the project stakeholder's name. While this is important information for an analysis of a project stakeholder's behavior, this does not always contribute to a time-series analysis of project stakeholders' behavior changes. In fact, Ikeda and Seki (2014) emphasize the importance of time-series analysis and provides an example in a visualized chart, though it is not necessary to generate this chart from Figure 1, directory. Figure 4 provides a supplementary table for a time-series analysis, though there are some discontinuities between Figure 1 and Figure 4. To solve some areas in Ikeda and Seki's (2014) proposal, Figure 3 shows a modification of Figure 1. Figure 3 has three parts to list project stakeholders' characteristics, for a probability and impact analysis of each project stakeholder, and for planning appropriate responses to each project stakeholder's characteristics and behaviors.

The list of stakeholders' general characteristics includes name, role, and identifying flags with the salience model in the four-dimensional stakeholder identification approach in Figure 2. As mentioned above, the salience model comprises three elements to describe project stakeholders. As a result of the process in Figure 2, the columns indicated by *P, L*, and *U*, contain the significance flag 1 and an insignificance flag 0. The simple Boolean operation makes it easy to understand the eight characteristics of project stakeholders with the salience model. This process helps to refine the results from the process in Figure 2.

The second step includes the probability and impact analysis of project stakeholders according to the development process indicated by the symbol *#n*, and impact (I) when the project stakeholder activates and its event probability (P) are added to the table. It is usually difficult to quantitatively score *I* and *P*, so this system uses qualitative scoring. Ikeda and Seki (2014) provide a guideline for qualitative scoring in their proposal, but this paper rewrites it as shown in Table 1 and Table 2 for impact and probability. The result from this analysis is an input in the visualization process. To complete column *IxP*, a value of *I* multiplied by *P* is calculated as when creating the PI matrix in project risk management.

The final step is planning appropriate responses to each project stakeholder's characteristics and behaviors, which is a new introduction in this analysis process. The columns should contain a realistic plan and actions for subjects and problems.

4. VISUALIZATION BY TIME-SERIES

Section 2 describes the proposed method to identify, characterize, and evaluate project stakeholders' influence on a project's success based on a systematic analysis and learnable approach. In this context, a learnable approach ensures that this

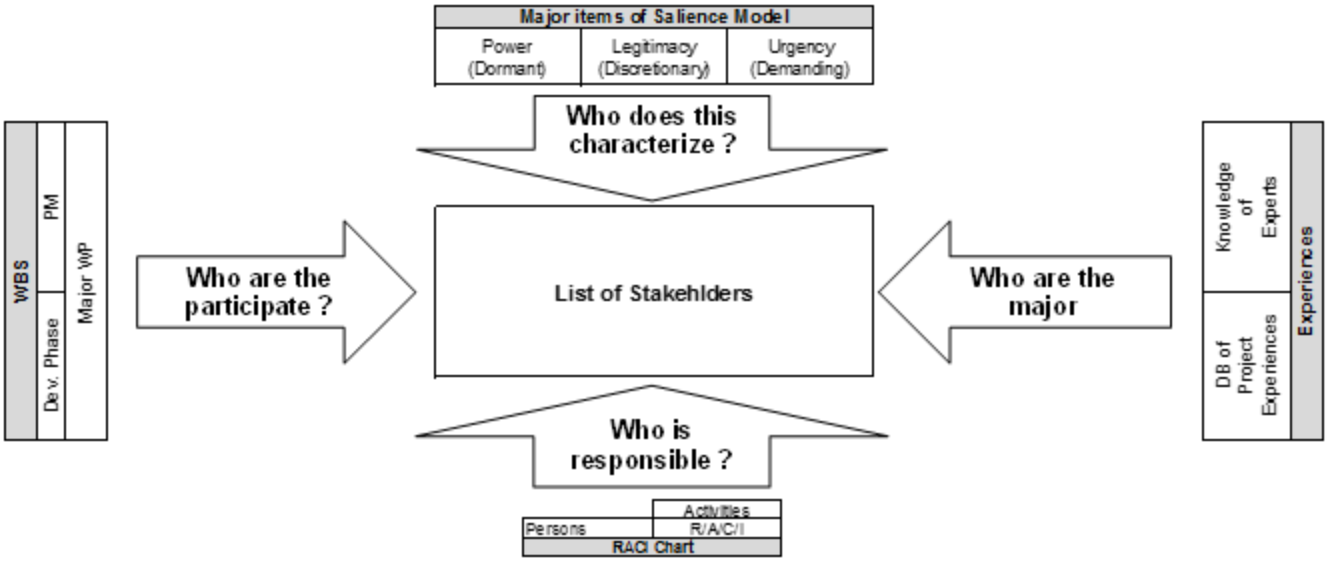

Figure 2: Four-dimensional Stakeholder Identification Approach

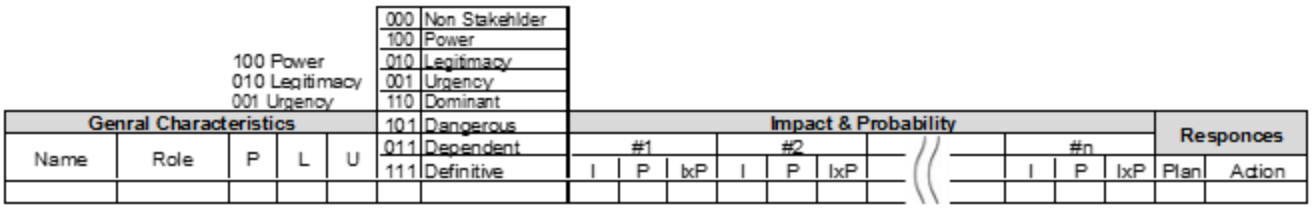

Figure 3: Stakeholders Analysis Table with Characterization and Impact & Probability Analysis

process supports the transfer of project experience to the organization. Therefore, the results from the project experience should be added to Figures 1 and 2 as an organizational property that should provide a template for future project stakeholder analysis.

This section proposes a mapping method to illustrate changes in stakeholders' characteristics with a time-series. The approach illustrated in Figure 2 is modified from Ikeda and Seki's (2014) proposal with complementary information to generate a time-series chart that expresses changes in project stakeholders' interests and behavior. Figure 3 shows an example of a time-series chart.

In Figure 3, the names of the development process are assigned to the horizontal axis. In Figure 2, the symbols for the development process are indicated by *#n*, with a numerical result from a qualitative evaluation of impact (*I*) and probability (*P*).

The value of *IxP* for each development process is assigned to the vertical axis with the name of the general characteristic indicated by the salience model.

5. CONCLUSION

This paper proposes a new strategic approach to project stakeholder management. A current topic in project stakeholder management is the lack of consideration for time-series changes in project stakeholders' interests and behavior.

The second section of the paper summarizes Ikeda and Seki's (2014) elements and uses other studies as the basis of this study is stated based on earlier studies of stakeholders and in related areas. The third section describes this study's proposal, which includes stakeholder identification, characterization, and evaluation visualization of stakeholders' interests and behavior. The fourth section provides the process to create a visualization of project stakeholders' interests and behavior.

As the future works, there are two subjects as follows:

1) This study does not provide the validity and efficiency of the proposal. To prepare for the practices, the interviews with the professionals of project management to confirm the validity and efficiency of the proposal will be performed.
2) The timing of rerating the stakeholder is not considered. The advantage of the proposal is the dynamic consideration and responses to the project stakeholder appearances and disappearances depending on the project progress. However, the timing for rating the stakeholders is limited to the early stage of project. To improve the reliability of the proposal. The timing of rerating should be reconsidered in the future work.
The reconsideration is required when the unfortunate outputs are delivered. In general, such unfortunate outputs are originated from direct and/or indirect reasons to the project. For example: the business downturn of customer/subcontractor, the losing project owner/manager trust in stakeholders, and the losing the motivation of project members. These unfortunate events often require the rerating the characteristics of stakeholders that is decided by salience model at the very beginning of the project. Basically, the project stakeholder management is one of the subject of project risk management. Therefore, when the changes of stakeholder management plan are required, the impact for project risk management should be considered, simultaneously. To realize the dynamic changes of project stakeholder management, the change control board (CCB) should be established involving not only the participants of project stakeholder management but also the project risk management.

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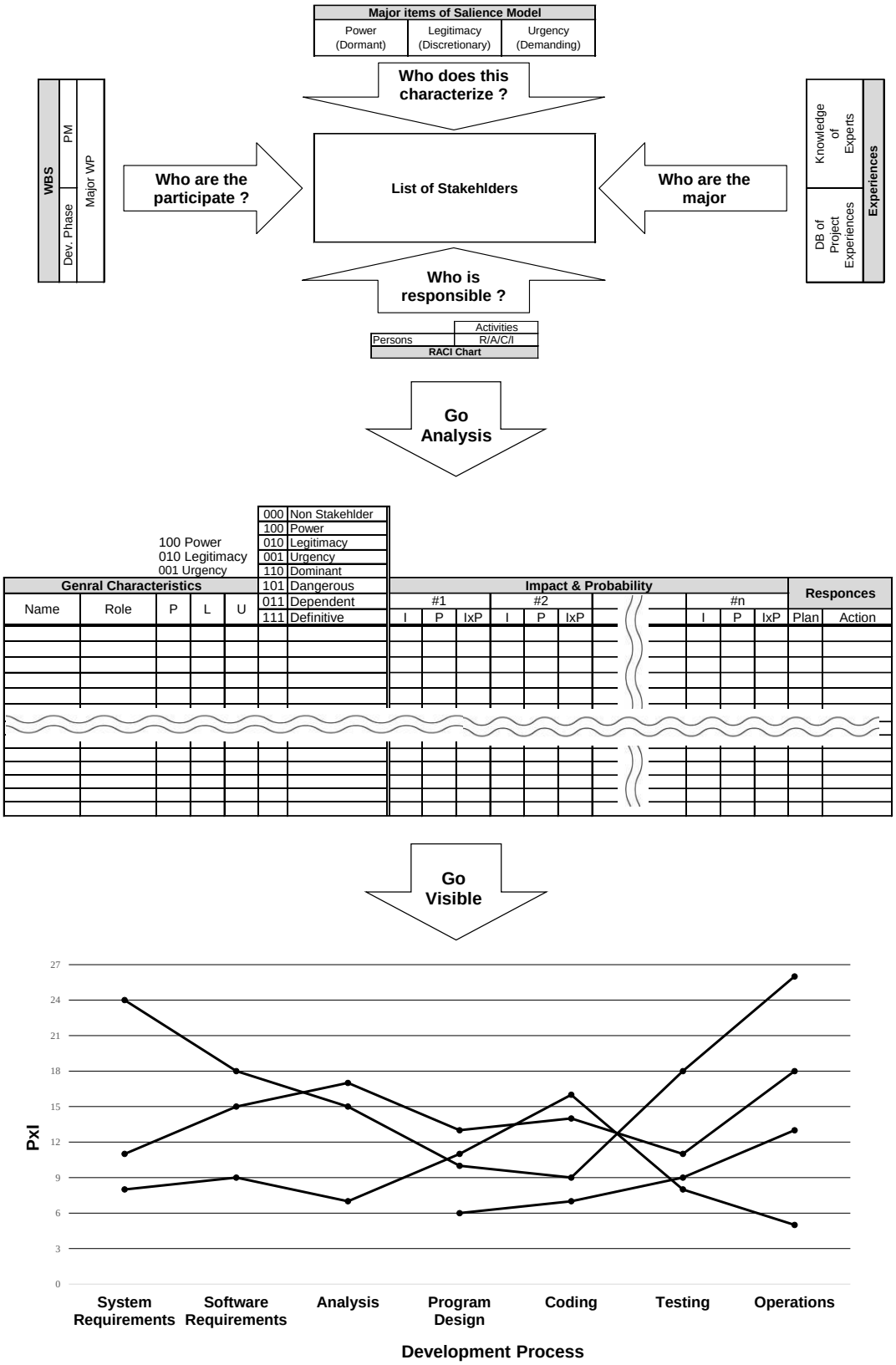

Figure 4: Proposed Procedure of Stakeholders Identification, Analysis, and Visualization